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SOME OBSERVATIONS ON HOSPITAL DUST

WITH SPECIAL REFERENCE TO LIGHT AS A HYGIENIC SAFEGUARD

BY

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Dust has been recognized as a vehicle of infection for many years, but preoccupation with "droplet" spread has obscured its true importance until recent times. The first of a series of modern studies revealing the actual infectivity of dust was that of Cruickshank (1935), who found that haemolytic streptococci could readily be cultivated from the air and dust in the burn wards of the Glasgow Royal Infirmary, where most of the patients were infected by these organisms. Elizabeth White (1936), working with Colebrook at Queen Charlotte's Hospital, showed that dust in single rooms used for patients with streptococcal puerperal fever contained the same streptococcus, and that sweeping and bed-making increased the numbers recoverable in plates exposed to the air. In one such room these proceedings were carried on for experimental purposes after the patient had left it, and the sweeper developed a throat infection due to the same type of streptococcus. It was also shown that streptococci in artificially infected dust will survive for 10 weeks, and that their mouse virulence is undiminished after 25 days. The infectivity of dust is also evident from the observations made by Brown and Allison (1937) in scarlet-fever wards. Diphtheria bacilli may also exist in floor dust in large numbers in the neighbourhood of infected patients; Crosbie and Wright (1941), who demonstrated this, also found that this organism can survive in stored dust, retaining its virulence, for as long as 102 days.

Cross-infection, by dust or otherwise, is particularly liable to occur in wards where there are many open wounds, and the war therefore concentrated attention on its mechanisms. The observations of Miles *et al.* (1940), Hare (1941), and Thomas (1941) have confirmed and extended our knowledge of dust-borne streptococcal infection, and the precautions necessary to prevent it are described in M.R.C. War Memorandum No. 6. The oiling of floors (van den Ende, Lush, and Edward, 1940; Thomas, 1941) and of bed-clothes (van den Ende and Spooner, 1941; Thomas and van den Ende, 1941; van den Ende and Thomas, 1941) is now recognized as a valuable safeguard in diminishing the amount of atmospheric dust, and thus the chances of cross-infection by this means.

The original purpose of the work described in this paper was to determine how far dust is responsible for cross-infection in surgical wards, and how much cross-infection is to be ascribed to other causes. This aim was not reached, except in showing that, under the conditions existing in some of the wards studied, dust is so infective that, without the aid of any other vehicle, it could well have caused all the accidental infections observed. Owing to novel and unexpected features in the results obtained, a study was then made of the conditions governing the survival of haemolytic streptococci in dust.

Methods

An ordinary sample of dust can easily be obtained by rubbing the dusty surface with a swab as used for throats or wounds: a large amount of dust, particularly of the fluffy variety, readily adheres to the cotton-wool. A few drops of sterile water were added to the tube containing such a swab, and a suspension of the dust was obtained by vigorously rotating the swab in this fluid. A loopful of this thick suspension was then sown on a 1 in 500,000 gentian-violet blood-agar plate (Garrod, 1942). The growth of almost all indifferent bacteria in dust, including all species of *Bacillus*, staphylococci, micrococci, *Sarcina*, diphtheroids, moulds, and yeasts, is inhibited on this medium, while *Str. pyogenes* grows freely and characteristically. So selective is the medium for this organism that almost pure cultures are sometimes obtained from an inoculum which on plain media would yield a confluent growth of bacteria classed in other circumstances as contaminants. That a thick suspension of what is really dirt should give either a nearly pure growth of a pathogen or an almost sterile plate is surprising, but it is a constant finding. *Viridans* streptococci (not usually of a type found in the mouth) and occasionally coliforms are the only other organisms commonly encountered. All haemolytic streptococci were grouped, and disregarded if not found to be of Group A; in some cases, when their precise identity was of interest they were typed. I am greatly indebted for this typing to the kindness of Dr. S. D. Elliott and to Dr. Dora Colebrook, of the Research Laboratory for Streptococcal Infections, Medical Research Council. For some purposes, to be described later, dust was collected by other methods, and studied quantitatively.

Distribution of Streptococci in Dust

Most of the observations hitherto made on dust-borne streptococcal infection have reference to floor dust. That this may be heavily contaminated with haemolytic streptococci, particularly under and around the bed of an infected patient, was amply confirmed in the present study. On one occasion a heavy throat carrier, whose condition was entirely unsuspected, was detected in the first instance by the discovery of very large numbers of haemolytic streptococci in the floor dust near her bed in an isolated corner of the ward. This was an 18-bed ward in which there had been a case of scarlet fever, while four other patients were known to be infected, either in a wound or in the throat. The floor was swabbed in the neighbourhood of each occupied bed, and while at least a few haemolytic streptococci were found in nearly every specimen (one exception being the floor beneath the bed previously occupied by the case of scarlet fever: this proved on inquiry to have been treated with dettol), the numbers were much greater in the neighbourhood of known infected cases and of the unsuspected carrier mentioned above.

This grossly infected ward was on the ground floor. Windows on the ground floor of this (E.M.S.) hospital are protected by brick blast walls built up to within 34 in. of the top of the

window at a distance of only 7 in. from it, thus shutting off the lower 4 ft. of the window completely. These wards are therefore very badly lighted, whereas wards on the first floor have no such protection and are well lit. Multiple specimens of floor dust were collected at various times from three ground-floor and three first-floor wards where cases of haemolytic streptococcal infection had occurred, usually in circumstances suggesting cross-infection, and there was a very marked difference between them in the frequency of positive findings (Table I):

TABLE I.—*Number of Specimens of Floor Dust containing (+) and not containing (–) Haemolytic Streptococci*

	–	+	% +
Ground floor	21	55	72
First floor	27	6	18

The two groups of wards were not strictly comparable, either in the circumstances prompting the investigation, which naturally varied, or in the type of case treated; but the difference between them was so evident as to suggest the overriding operation of one factor, and one possible factor appeared to be light.

Evidence capable of the same interpretation was being obtained at the same time in a different way. Dust was collected not only from the floors but from other surfaces on which it accumulated. The thickest dust (neglect of which is explained by shortage of domestic labour and lack of vacuum-cleaning facilities) was to be found on the black-out screens. Each window was obscured at night by lowering four hinged screens placed one above the other, and made of fibre board in a light wooden frame; by day these were hoisted and held by cords at an angle of about 70 degrees to the window. The sloping surface thus facing the ward, enclosed in a wooden frame over half an inch in depth, readily collected dust. Samples obtained from these screens and from parts of the windows themselves (e.g., upper surface of lower sash) form the first category in Table II. The second is a smaller category of sites intermediate in level between the window and the floor (skirtings and low shelves); the third consists of floor-dust specimens only. The figures refer to specimens from both ground-floor and first-floor wards.

TABLE II.—*Number of Specimens of Dust containing (+) and not containing (–) Haemolytic Streptococci*

Source	–	+	% +
Screens and windows	42	0	0
Skirtings, etc.	13	9	41
Floors	48	61	56

The difference in distribution here is clearly significant, and could be interpreted in the same way. Dust on or close to windows, and hence much more exposed to light than anything else in the ward, is, so far as these observations go, consistently free from haemolytic streptococci. It does not appear to differ in nature from floor dust, being composed mainly of blanket fluff, although it is lighter in colour owing to relative freedom from admixed dirt of various other kinds. It is possible, however, that a closer analysis of dust deposited at various levels might reveal unsuspected differences in composition.

In all the ground-floor and one only of the first-floor wards studied the floors were treated with spindle oil. This is known not to disinfect dust, but merely to prevent its diffusion. There is no apparent reason, on the other hand, why it should encourage the longer survival of streptococci, or otherwise so act as to complicate the interpretation of these findings.

Action of Light on Haemolytic Streptococci

Dust is an inconstant and difficult material to work with, and it seemed better to get further information about the action of daylight on streptococci by using some other medium. Buchbinder *et al.* (1942) obtained data on this subject by spraying organisms into the air, whence they settled on filter papers in Petri dishes; after exposure to various types of light these were cultivated. *Str. pyogenes* survived only 65 hours in the dark under these conditions, which therefore seem too unfavourable to the organism. Exposure to daylight (not sunlight) sterilized these preparations in about four hours. C. R. Smith (1942), studying the survival of tubercle bacilli, after failing to detect them in dust from rooms occupied by sputum-positive cases, dried either culture suspensions or actual sputum on cover-slips, and exposed these in an unglazed north window. He found that the bacilli in these films were usually dead within four days, whereas in a drawer in the same room they survived for two or three months, and in a refrigerator for over six months. Survival was longer in films made from sputum. The use of natural material is clearly preferable, and Smith's method was adopted with modifications for the present purpose.

Experiments with Films of Dried Pus.—Pus containing haemolytic streptococci was diluted with sterile glass-distilled water (1 in 2 000 in the first experiment; 1 in 20 and 1 in 5 in later experiments), and a loopful of this dilution was spread over an area about 1.5 cm. in diameter on a sterile slide and allowed to dry. These slides, of which as many as 60 were made for each experiment, were placed film upwards in Petri dishes, and sets were kept in each of three or four situations: (1) the ledge immediately inside a first-floor laboratory window facing south; (2) the ledge inside a window on the opposite side of the same laboratory—i.e., facing north and never exposed to direct sunlight; (3) a dark cupboard in the same laboratory; (4) a refrigerator at about 4° C. Cultures were made, at lengthening intervals, by adding enough blood agar (about 4 c.cm.) at 46° C. to form an adequate layer over the slide. A confluent haemolytic growth from the area of the film was succeeded later, as the number of survivors fell, by diminishing numbers of discrete colonies and eventually by total sterility. The results of four such experiments are given in Table III.

TABLE III.—*Survival of Str. pyogenes in Dried Films of Pus*

Date of Start of Experiment	Dilution of Pus	Number of Days of Survival*			
		South Window	North Window	Cupboard	Refrigerator
Sept. 7, 1942 ..	1 in 2,000	≤1	6–8	>18	
„ 11, „ ..	1 in 20	3–4	7–11	31–45	
Nov. 13, „ ..	1 in 5	10–13	13–17	75–92	>92
Mar. 6, 1943 ..	1 in 5	6–9	13–19	103–110	41–52

* The first figure given is the day of the last positive culture, the second that of the first negative: > means all films used before a negative was obtained.

The increasing concentrations of pus were used, as it was found that these thicker films were sterilized by exposure to ultra-violet light, and were thus suitable objects for testing the bactericidal action of other kinds of light. (For exposing these films and other materials to measured doses of ultra-violet light I am indebted to Dr. L. D. Bailey and Miss Greenhill of the physiotherapy department of this hospital.)

These observations tally with those of C. R. Smith. The streptococci died most rapidly in a position exposed to sun-light, in spite of this having to traverse two layers of ordinary glass (the window and the Petri dish); survival was naturally longest in the experiment begun in November. Diffuse daylight in the north window was also lethal within 13 days or less, whereas in a dark cupboard in the same room, and hence under identical conditions apart from light, survival was prolonged for many weeks. Survival was longest in the refrigerator in one of the two experiments employing this site; in the second, sterility after 52 days is unexplained, but may possibly have been due to the action of some noxious vapour.

Action of Light on Infected Dust in Vitro

Two attempts were made to assess the bactericidal action of natural light on haemolytic streptococci in dust. This was obtained by vacuum-cleaner from floors known to be infected and weighed in tubes, the contents of which were subsequently scattered in Petri dishes, and placed either on the north window ledge or in the cupboard already mentioned. Counts of colonies in pour-plates of gentian-violet blood agar from a measured inoculum of volumetric suspensions showed little change in the cupboard dust and a fall of the order of 98% in the window dust within a few days; but duplicate counts

varied, owing evidently to lack of homogeneity in the material. This experiment was done in July. A much more elaborate repetition was begun in January, when heavily infected dust was obtained by passing a vacuum-cleaner over the bed-clothes of four patients known to have haemolytic streptococcal infections. This dust was filtered through gauze to remove coarse particles, yielding a dense fine grey powder, of which 20 mg. was kept in each of many tubes either in the dark or exposed to north daylight, and cultivated quantitatively from time to time. Neither in tubes nor in Petri dishes in which their contents were subsequently spread out as far as possible did this dust cease to yield haemolytic streptococci in culture until April 2, the experiment having been begun on Jan. 18. Winter conditions may have accounted partly for this long survival, but a more important reason was probably the nature of the material itself; ultra-violet light failed repeatedly under various conditions to kill more than a proportion of the streptococci in it, and it may be that dust in this artificially concentrated form is more protective to contained bacteria than the looser aggregations of natural dust.

The main interest of this experiment was the survival period in the dark. The original number of living haemolytic streptococci per gramme of dust was 204,000; succeeding counts were 176,000 on Jan. 25; 5,900 on March 19; 8,700 on April 2; 2,700 on May 4; 700 on June 4; and 300 on August 2, when the last available tube was cultivated. The three colonies in this last culture were all of Group A, and that sent to Dr. Elliott proved, as did a subculture from the plate of June 4, to be of Type 11. This type was responsible for the epidemic in progress in the ward when the dust was collected six and a half months earlier (195 days). This is the longest survival on record.

Discussion

These imperfect observations are placed on record in order to draw attention to the possible importance of good natural illumination as a hygienic safeguard, and in the hope that they may lead to further study of this subject. Although good lighting is universally recognized as desirable, it has never, so far as I am aware, been insisted on as a prime necessity in wards for septic surgical cases. This study suggests that in such wards it has an important part to play, particularly if no special measures (such as the oiling of bed-clothes and vacuum dust extraction) are taken to prevent the atmospheric diffusion of dust. It has been shown that haemolytic streptococci naturally present in dust will survive for over six months in the dark. It was noticeable that dark corners on the floors of infected wards were always more liable to yield dust containing haemolytic streptococci than more open situations; one dark recess beneath a bookcase was repeatedly sampled, and never failed to yield them. Prolonged ward epidemics with long intervals between fresh cases are readily explicable in such conditions. It was also found that dust on or close to windows never contained haemolytic streptococci, whether exposed to direct sunlight or not. Whether this is an effect of light, or is partly or wholly explicable on other grounds, can only be settled by further observations.

The quantitative study of bacteria in natural dust *in vitro* is beset by difficulties, and it is not claimed that direct proof of the disinfectant action of light on this material has been obtained. Of the action of light on haemolytic streptococci in another natural medium there can be no question; dried films of pus are of the same nature as infected dry particles liberated from a wound dressing, and form an unexceptionable test object. These are sterilized within a few days by diffuse north daylight passing through two layers of glass, whereas in the dark the streptococci in them remain viable for weeks. My observations on this point differ from those of C. R. Smith, since no glass was interposed between his cover-slip films and the northern sky of California. Preoccupation with the ultra-violet part of the spectrum has led to a common belief that only direct sunlight is usefully bactericidal; it must now be recognized that ordinary diffuse daylight, even on a cloudy day and even in winter in England, can be lethal to bacteria, and that glass is no absolute bar to this effect. The conditions governing this type of light effect would evidently repay further investigation from several points of view.

Summary

In wards where there are patients with haemolytic streptococcal infections dust may contain these organisms in large numbers, particularly near infected patients' beds.

Haemolytic streptococci were found to be most numerous in floor dust, and were absent from many specimens of dust in the same wards collected from sites on or close to the windows. They were more often found in dust from exceptionally dark wards than in comparable specimens from normally lit wards.

Haemolytic streptococci of Group A, Type 11, in naturally infected dust survived in small numbers in the dark at room temperature for 195 days.

Ordinary diffuse daylight is bactericidal to haemolytic streptococci. The interposition of glass does not prevent this effect, and it occurs even under winter conditions in England.

These facts suggest the possibility that good natural lighting may be a factor in preventing the atmospheric spread of infection in surgical wards and elsewhere.

I am indebted for valuable technical assistance in this work to Miss P. M. Waterworth. Her services and the equipment of the laboratory in which most of the work was done were made available by the generosity of "Bundles for Britain," which organization provided a fund under the control of Mr. Rainsford Mowlem for laboratory work in connexion with his surgical unit. I am also indebted to the medical superintendent of the hospital for permission to publish these findings, and to Mr. Mowlem and other members of the surgical staff for allowing me to refer to cases and conditions in their wards.

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A NOTE ON THE TRANSMISSIBILITY OF HAEMOLYTIC STREPTOCOCCAL INFECTION BY FLIES

BY

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During the investigations described in the preceding paper by Prof. L. P. Garrod, when explanations were being sought for cross-infections in surgical wards, attention was directed to the possibility that these might be conveyed by flies. Wounds and septic dressings attract flies, and in some circumstances cannot altogether be protected from them.

In Sept., 1942, when flies abounded in this hospital, it was decided to catch some and cultivate them. They were trapped actually in a Petri dish containing blood agar, one half of the plate being spread with three drops of 1 in 3,000 gentian violet, as recommended by Fleming, and simply incubated in the plates, their busy wanderings on the surface of the medium being relied on to inoculate it with whatever bacteria might be on their feet. After overnight incubation the flies were found dead.

The flies were caught in two surgical wards where there were cases with streptococcal infections; a control series was caught in the laboratory. Of 27 flies caught in these wards 3 gave sterile plates, 9 gave cultures containing haemolytic streptococci, three of which proved to be of Group A, while the remainder grew a variety of other organisms, including coagulase-positive staphylococci and coliform bacilli; 2 plates were overgrown with *Proteus*. Of cultures from 22 flies caught in the laboratory 5 were sterile, 2 overgrown with *Proteus*, and the remainder grew a variety of unidentified organisms; there were no haemolytic streptococci in any culture.

Two of the three Group A strains isolated from ward flies proved to be of Type 4. Since a close check was being kept on all wound and throat infections in these wards, all Group A streptococci being typed by the kind co-operation of Dr. S. D. Elliott, it is possible to trace a hypothetical relationship between a carrier condition in these flies and infections in the human population of the wards. Type 4 had been identified only once previously—in a sore throat in a nurse ten days before the infected flies were caught; it is possible that this nurse conveyed the infection to a wound in which it escaped recognition. During the following two months Type 4 was recovered from eight further persons, six having wound and two throat infections. All these cases occurred in one of the two wards studied, and it was in this ward that both of the Type-4-carrying flies had been caught. After this stage two patients—one admitted to each ward—were found to have a Type 4 wound infection on admission, and 15 further cases in the two wards during an ensuing period of three months from that time are therefore not necessarily traceable to the earlier cases.

These observations do not prove the transmission of haemolytic streptococcal infection by flies, but they strongly suggest its possibility. When infection spreads otherwise inexplicably from one part of a hospital to another this agency should perhaps be considered.

Acknowledgments are due, as in the preceding paper, to the fund by which this study of wound infections was supported, and to Mr. Rainsford Mowlem. The work was done under the direction of Prof. L. P. Garrod, to whom we offer our thanks.

THE HALDANE HAEMOGLOBINOMETER

I. IRON, OXYGEN, AND THE BRITISH STANDARDS INSTITUTION COLOUR STANDARD

BY

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For more than 40 years the Haldane–Gowers haemoglobinometer has been in general use in this country, and for most clinical purposes it has been a satisfactory instrument. When, however, its results, changed by means of the traditional conversion factors into units of oxygen capacity and thence into grammes of haemoglobin, are compared with those of other methods in other countries, a curious discrepancy is apparent which has led to much confusion. Added to this, there is now a demand for a high degree of accuracy, resulting from the widespread adoption of the haemoglobin level as an index of nutrition and of haemoconcentration in shock. Judged by this more exacting requirement, it has become only too clear that the instrument as generally used may give dangerously inaccurate and variable results, and that a complete investigation of its efficiency is urgently needed.

The establishment by Donaldson, Harding, and Wright (*J. Path. Bact.*, 1943, **55**, 205) of a permanent B.S.I. Haldane colour standard, together with a means for accurate comparison at the National Physical Laboratory, has, for the first time, provided the essential fixed point on which such an investigation must be based. We have taken advantage of this standard in certain observations, which, though they have no claim to the desired completeness, may serve to guide further work. The problem of haemoglobinometry has been solved to their own satisfaction by a succession of workers during the past 60 years, but it still exists in all its complexity. We have at least avoided this one pitfall, of supposing our results to be final.

The first step in the present investigation has been an attempt to determine the mean oxygen capacity and iron content of blood of a colour equal to 100% of the B.S.I. colour standard. This attempt, which has met with unexpected difficulties, is here briefly described. The variability of the results of haemoglobin estimation by the Haldane–Gowers method under different conditions and in the hands of a large number of trained observers will be dealt with in a second communication. Finally, the puzzling systematic discrepancy between the results of this method and those of others, bound up as it is with the history of the Haldane standard, will later be discussed in the form of a review of the literature.

Method of Investigation

Material.—Blood was taken by venepuncture, a tourniquet being applied for the minimum time necessary to produce adequate venous distension and being released at the instant of puncture. The blood was heparinized, and within a few minutes of collection was divided into the required number of sub-samples, the vessel being shaken continuously to ensure even sampling.

The subjects were healthy adults (members of the hospital staff and medical students), 29 being males and 20 females. Unfortunately these were not evenly distributed in chronological order, most of the females being towards the end of the series—a fact that has complicated analysis of the results. The figures obtained in one other case, including an obviously erroneous iron estimation, have been omitted.

The following determinations were made on each blood sample and (except for iron determination) on the day of collection.

1. *Oxygen Capacity* (H. M. Jope).—This was estimated by the constant-volume van Slyke method, all measurements being made with carefully calibrated apparatus. Duplicate or triplicate estimations were made and the mean figure taken. In 20 blood specimens the CO capacity was also determined as a check on oxygen measurements. In addition 11 estimations of oxygen capacity have been made by Prof. C. G. Douglas, using the Haldane blood-gas apparatus, in parallel with the van Slyke estimations. The results of the two methods are in good proportional agreement, though the Haldane method gives results averaging 0.35 ml. % lower.

2. *Iron Determinations* (J. R. P. O'Brien and P. Quelch).—Haemoglobin iron was estimated by the Klumpp titanous chloride method, the results being the average of duplicate determinations. The method was standardized against pure iron wire, and all apparatus was carefully calibrated.

3. *Ultra-violet and Visible Absorption Spectra* (E. M. Jope).—A Hilger E3 medium quartz spectrograph and a Spekker photometer with ribbon filament lamp were used. The plates were matched on a photo-electric microphotometer. The results in the visible range were checked by two estimations made in parallel with the National Physical Laboratory spectrophotometer. To save space only the ultra-violet readings are quoted, and these have been expressed as a percentage of the B.S.I. standard on the basis of six determinations in parallel with the N.P.L. comparator.

4. *Haemoglobin Estimations* (B. Amos and R. G. Macfarlane).—The Haldane–Gowers haemoglobinometer was used. B.S.I. standards, diluting tubes, and pipettes were employed, and the necessary correction factors were applied. Each estimation was the mean of independent determinations by both observers, except for a period when one was not available. About halfway through the series both observers made many observations in parallel with colorimetric determinations by the National Physical Laboratory to eliminate personal errors, and this procedure was followed by rather higher readings being obtained from this point onwards. At the time of each estimation the observers were in ignorance of any other estimation on that blood sample—a matter of importance in view of the great susceptibility of this method to bias. In addition to the estimation of colour by the Haldane–Gowers method, six samples of blood were sent to the National Physical Laboratory for direct comparison with the colour standard by means of the special comparator. The figures so obtained were then

correlated with the other estimations which had been simultaneously carried out in Oxford. This procedure was designed as a check on the visual estimations of colour, which were considered to be most liable to error.

5. Red Cell Counts (B. Amos and R. G. Macfarlane).—Red cells were counted, using N.P.L. certified pipettes and counting-chambers. The recorded figures were the means of duplicate independent determinations by both observers.

6. Packed Cell Volume.—Duplicate determinations were made in N.P.L. certified haematocrit tubes, spun for 30 minutes at 3,000 revolutions a minute at a radius of 5½ in.

Results

(Analysed by R. G. Macfarlane and R. H. Mole)

Space does not allow more than the means and coefficients of variation to be given, and these have been arranged in tabular form. The complete figures have been deposited with the Medical Research Council, and can be seen if desired.

TABLE I.—*Determinations (V = Coefficient of Variation)*

Estimation	(A) Series o 49		(B) 29 Males	(C) 20 Females	(D) 6 N.P.L. Samples
	Mean	V (%)	Mean	Mean	Mean
Haemoglobinometer reading (% B.S.I. standard)	101·40	9·00	106·80	92·95	103·40 (By N.P.L. comparator) 103·40
Spectrophotometer reading (% B.S.I. standard)	102·50	9·38	109·30	93·20	
Red cells (10^6 per c.mm.)	5·23	8·39	5·51	4·82	5·30
Packed cell volume (%)	44·80	7·61	47·03	41·55	44·60
Oxygen capacity (ml./100 ml.)	20·11	9·15	21·30	18·37	20·34
Iron content (mg./100 ml.)	50·40	9·98	53·96	45·24	49·83

The means and coefficients of variation are given for the 49 sets of six estimations in Column A. Then follow the means for males and females separately, and finally those of the six samples in which the haemoglobin was estimated by the N.P.L. comparator. From these six samples it was calculated that HbO_2 $E_{1\text{ cm.}}^{1:1.000}$ ($\lambda = 414$ mμ) 1.18 was equivalent to 100% of the B.S.I. standard, and the spectrophotometric readings are given as a percentage of this extinction coefficient.

TABLE II.—*The Mean Equivalent of 100% B.S.I. Standard, as determined by the Haldane-Gowers Haemoglobinometer (H), the Spectrophotometer (S), and, in Column 5, by the N.P.L. Comparator in Six Cases*

1	2	3			4			5
Estimation		Series of 49			Last 24			Six N.P.L. Cases
		All 49	29 Males	20 Females	All 24	11 Males	13 Females	
Oxygen capacity (ml. per 100 ml.)	H	19·89	19·97	19·78	19·60	19·48	19·71	19·70
	S	19·55	19·46	19·70	19·70	19·51	19·88	
Iron content (mg./100 ml.)	H	49·81	50·59	48·68	48·66	49·16	48·24	48·26
	S	48·97	49·29	48·50	48·90	49·25	48·67	
Red cells (10^6 per c.mm.)	H	5·17	5·16	5·18	5·14	5·12	5·16	5·19
	S	5·09	5·03	5·18	5·17	5·11	5·22	
Packed cell volume (%)	H	44·37	44·11	44·75	43·60	42·80	44·30	43·72
	S	43·60	42·98	44·59	43·80	42·80	44·70	
Spectrophotometer reading	H	101·70	102·50	100·20	99·40	99·80	99·10	100·00

In this table the results have been expressed as the mean equivalents of 100% haemoglobin measured by the haemoglobinometer, the spectrophotometer (indicated by the letters H and S respectively in Column 2), and, in the last column, by the N.P.L. comparator on six samples. The values for the whole series and for males and females are given separately in Column 3. It will be seen that the haemoglobinometer ratios are consistently higher than those of the spectrophotometer, suggesting that the average readings of the haemoglobinometer were about 2% too low. Analysis of the series in chronological groups shows a reduction in this discrepancy about half-way through the series when estimations in parallel with the N.P.L. were begun. The resulting change in the statistics affected the sexes unequally, since there were more females in the second half of the series than in the first. It is for this reason that the results for the last 24 samples have been given in Column 4, and here it will be seen that the two methods of estimation agree to about 1% or less.

Despite these variations, the following points are clear from Table II: (*a*) The B.S.I. standard is equivalent to about 19.7 ml. O_2 per 100 ml. and about 49 mg. of haemoglobin iron per 100 ml., instead of the expected 18.5 ml. O_2 per 100 ml. and 46.25 mg. Fe. (*b*) There seems to be a sex difference in the relations between iron, oxygen, and colour.

TABLE III.—*The Coefficients of Variation (V) of the Ratios of Haemoglobin as estimated by the Spectrophotometer (S) and Haemoglobinometer (H) to Oxygen, Iron, Red Cells, and Cell Volume Estimations, and of Iron to Oxygen*

Ratio:	$\frac{O_2}{S}$	$\frac{O_2}{H}$	$\frac{Fe}{S}$	$\frac{Fe}{H}$	$\frac{O_2}{Fe}$	$\frac{S}{H}$	$\frac{R.B.C.}{S}$	$\frac{R.B.C.}{H}$	$\frac{P.C.V.}{S}$	$\frac{P.C.V.}{H}$
V % Series of 49	3·12	4·27	2·42	4·04	3·46	3·48	4·66	4·00	3·46	3·68
V % Series of 24	1·81	3·68	2·47	3·92	2·85	2·95	5·31	4·28	3·58	3·36

Some idea of the correlation of two sets of variables is given by the coefficient of variation (V) of their ratios. Table III contains the values for V of the ratios given in Table II. A range of twice the coefficient of variation above and below the mean will probably be found in a series of 22 such ratios, and serves as a useful index of the "probable range" of variation. On the figures for the whole series, and taking $\pm 2V$ as the probable range, in 22 blood samples with the same spectrophotometric reading two estimates of the oxygen capacity may differ by as much as 12%, or 17% if the haemoglobinometer is used instead of the spectrophotometer. It will be seen in this series that the best agreement is between iron estimation and the spectrophotometer, with a "probable range" of less than 10%.

The figures for the last 24 subjects show a considerable reduction in the variability of the ratios in which oxygen estimation takes part, particularly in that of oxygen to spectrophotometer in which the "probable range" has been reduced to about 7%. This improvement is presumably due to technical advance in the oxygen measurements. The other ratios show variable changes.

TABLE IV.—*Other Ratios: Colour Index; Mean Corpuscular Volume; Mean Corpuscular Oxygen and Iron; Oxygen and Iron Concentrations; Oxygen per gramme of Iron; Mean Corpuscular Haemoglobin; and Haemoglobin Concentrations*

Ratio	Series of 49		29 Males	20 Females	N.P.L. Samples
	Mean	V (%)	Mean	Mean	Mean
Hb/R.B.C. (C.I.)	0·967	4·00	0·969	0·965	0·97
P.C.V./R.B.C. (M.C.V.: c.μ)	85·8	4·03	85·33	86·46	84·52
O_2/R.B.C. (M.C.O_2: c.μ) ..	38·48	4·08	38·69	38·17	37·98
Fe/R.B.C. (M.C.Fe: $\gamma\gamma$) ..	0·0964	4·87	0·098	0·0939	0·093
O_2/P.C.V. (O_2: ml./100 ml.)	44·85	3·76	45·29	44·22	44·96
Fe/P.C.V. (Fe: mg./100 ml.)	112·35	3·82	114·76	108·84	110·02
O_2/Fe (O_2: ml./g. Fe) ..	399·5	3·46	394·8	406·3	408·1
Hb/R.B.C. (M.C.Hb: $\gamma\gamma$) ..	28·7	4·00	28·76	28·64	28·67
Hb/P.C.V. (Hb: g/100 ml.).	33.5	3·68	33.6	33·2	33·95

In this table the means of other ratios are given, usually in a form that is already familiar. The ratio of colour estimation to red cell count, for instance, is given as the ordinary "colour index"; packed cell volume to red cell count as the "mean corpuscular volume." The figures for mean corpuscular haemoglobin and haemoglobin concentration have been calculated from the haemoglobinometer readings by the use of Hufner's factor, and on the assumption that 100% colour is equivalent to our observed figure of 19.7 ml. oxygen per 100 ml. Such a conversion, included here for comparison with the previous findings in the literature, is arbitrary and gives a false impression of accuracy. The oxygen capacity per gramme of corpuscular iron is very near the theoretical figure, but again it is of interest to observe the sex difference.

Discussion

A difficulty in attempting to define the British Standards Institution colour standard in any terms except those of colour is the fact that other measurable attributes of haemoglobin, such as iron content and oxygen capacity, are not, as determined by us, strictly proportional to the readings obtained with the Haldane haemoglobinometer and the spectrophotometer. Part of this lack of proportionality is, of course, due to instrumental and technical defects, and it is evident that as our series progressed some of these difficulties were overcome to an extent that materially lessened the variability. Nevertheless, even in the latter part of our series blood samples of the same extinction coefficient as measured by the spectrophotometer might show estimated oxygen capacities differing by 7% and iron contents differing by nearly 10%, while if the haemoglobinometer is used as a measure of haemoglobin these differences are increased to nearly 15% and 16% respectively.

A further part of this variability may be due to the presence of inactive haemoglobin and/or non-haemoglobin iron, the presence of which in larger amounts in men than in women might explain our observed sex difference. It ought to be pointed out, however, that this series was not planned to determine the extent of such sex differences, which were, in fact, not expected. In consequence our efforts to arrive at a satisfactory estimate of their statistical significance have proved fruitless, and the usual criteria, being in this series misleading, have been omitted. It is therefore difficult, if not impossible, to say how much of the observed variation between colour, oxygen capacity, and iron content was due to technical error, and how much to a genuine difference from one sample to another. Thus it is desirable to repeat the observations in a further series that has been carefully planned beforehand to make such an analysis possible.

It is quite clear that, in our hands, there is a large variability in haemoglobin estimation by the Haldane–Gowers haemoglobinometer. If a further series is attempted some other and more precise method for estimating colour must be employed—preferably the efficient comparator as used by the National Physical Laboratory.

Despite these variations there seems little doubt that the B.S.I. colour standard is equivalent to a greater mean haemoglobin, oxygen capacity, and iron content than was expected, though it is still conveniently close to the haemoglobin level associated with 5 million normal red cells per c.mm. This finding has an interesting bearing upon the supposed difference between English and American normal haemoglobin values. It also raises the questions why and when the standard changed from Haldane's original value, or whether in fact the Haldane standard has always been underestimated. These matters will be fully discussed in the third paper in this series.

Summary and Conclusions

We have observed a lack of proportionality in the results of haemoglobin estimations by the Haldane–Gowers haemoglobinometer, the spectrophotometer, oxygen capacity, and iron determination on 49 blood samples.

Part of this variation is obviously due to technical error, and a further part seems to depend on a sex difference in the relative proportions of colour, iron content, and oxygen capacity of haemoglobin.

The British Standards Institution Haldane colour standard is apparently equivalent to 19.7 ± 0.2 ml. oxygen capacity per 100 ml. of blood, and 49 ± 0.8 mg. of iron per 100 ml. Because of the variation already mentioned, more exact figures cannot be given at present.

The Haldane–Gowers method for estimating haemoglobin has shown itself to be insufficiently exact in our hands for purposes of standardization, and, in any future attempt to define the B.S.I. standard, should be replaced by the N.P.L. comparator.

We are particularly grateful to Dr. R. Donaldson and Mr. H. O. W. Harding of the National Physical Laboratory for their willing and extensive co-operation. We wish to thank Dr. C. R. Harington, Prof. R. A. Peters, and Dr. A. H. T. Robb-Smith for their criticism and advice, Dr. E. J. King for a sample of pure iron wire, and Dr. E. R. Holiday for placing the spectrographic equipment at our disposal. The expense of this investigation has been borne by the Medical Research Council.

THE HAEMOGLOBIN EQUIVALENT OF THE B.S.I. HALDANE STANDARD

BY

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The classical procedure of Haldane (1900) for estimating haemoglobin in the blood has been widely used in this country for nearly half a century, and most of the records in the medical literature of haemoglobin concentrations are in terms of the Haldane standard. By estimating the oxygen capacity of the blood of 12 healthy male persons Haldane arrived at an average figure of 18.5 ml. of O_2 per 100 ml. of blood. This figure he took to be the oxygen equivalent of "normal" adult blood, and he defined his 100% haemoglobin standard in these terms.

The Haldane method consists in saturating a measured quantity of blood in water with carbon monoxide, and diluting the cherry-red colour so obtained until it matches a standard 1 in 100 dilution of 18.5 ml. O_2 blood which has been similarly gassed with CO. For convenience the standard CO–Hb solution has usually been sealed up in small test-tubes of standard dimensions, in which it has appeared to remain unaltered in colour for surprisingly long periods of time, in some cases for many years. The quality of the glass undoubtedly has an effect on the keeping quality of the CO–Hb solution, and where inferior glass has been used Haldane standards have been known to become unusable because of an obvious change in colour.

This and other shortcomings in the routine Haldane procedure led Clegg and King (1942) to adopt an alkaline haematin method of estimating haemoglobin, which, they showed, was readily adaptable to precise colorimetric measurement in either Duboscq or photo-electric instruments. For this method a haemoglobin concentration of 15.6 g. Hb, equivalent to 20.9 ml. O_2 per 100 ml. of blood (Haden, 1922), was used as the standard 100% of normal, as this figure appeared from modern work (e.g., Peters and van Slyke, 1932; Wardlaw, 1941) to be a more probable average of normal adults than the earlier, and lower, Haldane figure.

Previously, all haemoglobin estimations in the Hammersmith Hospital had been made by the Haldane method, and it was anticipated that the determined percentage values would show a sudden drop on introducing the new method and the higher standard. The change encountered was much smaller than was expected. This led us to suspect that our Haldane standards represented a higher haemoglobin concentration than the 13.8 g. per 100 ml. which is the equivalent of 18.5 ml. of O_2. We have therefore calibrated our tubes of Haldane standard by reference to a number of bloods whose haemoglobin content has been assessed by accurate iron analyses (titanous chloride method of Delory, 1943) and comparisons with photometric haematin results. Our Haldane tubes have been compared by the National Physical Laboratory with the Haldane standard prepared by Donaldson, Harding, and Wright (1943). These authors have recently attempted to standardize the Haldane method and to define accurately the colour of the tubes of CO–Hb which are used as standards for the routine comparisons. As a result of our measurements we have determined that the colour of the British Standards Institution Haldane standard is in fact equal to that given by blood of 19.8 ml. O_2 capacity (14.8 g. Hb) per 100 ml., and not of its stated strength of 18.5 ml. O_2 or 13.8 g. haemoglobin.

Experimental Methods

Taking of Blood.—(1) Blood was drawn by venepuncture without stasis and delivered into bottles containing potassium oxalate. It was mixed by gentle inversion before measurement. (2) Free-flowing blood from the lobe of the ear was collected

in capillary pipettes. The lobe was carefully dried before pricking, and the first drop of blood was discarded.

Pipetting.—All pipettes were calibrated "to contain."

Iron Analyses.—Duplicate samples of 10 ml. of blood were ashed and analysed for iron by the titanous chloride procedure described by Delory (1943). The $TiCl_3$ was made up in freshly distilled water saturated with CO_2. The standard iron-alum solution was referred to B.D.H. "extra pure" iron wire (99.6% Fe).

Alkaline Haematin Determinations.—These were carried out according to Clegg and King (1942).

Haldane Determinations.—(1) "Direct" Method:—0.02 ml. of blood was delivered into 0.4% ammonia solution in an N.P.L.-calibrated dilution tube, gassed with pure CO, and diluted to match the standard tube. (2) "Indirect" Method:—In one set of comparisons of the Haldane with the alkaline haematin procedure an attempt was made to eliminate sampling errors in the following manner. A single sample (0.2 ml.) of blood was diluted with 9.8 ml. of N/20 NH_3. 1 ml. of this haemolysed solution, equivalent to 0.02 ml. blood, was used for the Haldane estimation; and 3 ml., plus 3 ml. N/5 NaOH, for the alkaline haematin procedure. The 1-ml. Ostwald pipette was calibrated to "blow out" and a correction factor used. The same 3-ml. pipette was used for measuring both the haemolysed blood and the sodium hydroxide solution, and so no correction factor was necessary. Since the same blood solution was used for both methods the 0.2 ml. and 9.8 ml. measurements did not require to be strictly accurate.

Measurement of Colour.—The alkaline haematin test solutions were compared with standard haemin solutions in a Duboscq colorimeter using mercury green light, or in a King (1942) photo-electric colorimeter with a Chance green light filter. The CO-Hb solutions were matched by dropwise dilution of the test solutions to match the standard in a Hawksley comparator. The tubes were repeatedly shifted from left to right and right to left, following the "titration" procedure recommended by Haldane. The adding of diluting fluid and matching of colours were done by one operator, and the observations and recordings of the readings by a second. All comparisons were made in duplicate, in the first 20 comparisons by different observers, and the duplicates averaged.

Determination of Haldane Equivalents.—Each Haldane reading was subjected to the corrections furnished by the National Physical Laboratory for the standard, the dilution tube, and the pipette. (The N.P.L. calibration figures for tubes and pipettes agreed closely with the calibrations for the same instruments which we determined ourselves.) The 100% equivalent of iron, or of oxygen or haemoglobin, was calculated for each blood, and the average equivalent then taken for each series of bloods analysed.

Results

Comparison with Iron Analyses.—Table I gives the results of the analyses of samples of bloods taken from 20 healthy adults, most of them Army medical officers.

Comparison with Alkaline Haematin Values.—These are expressed in terms of mg. of Fe or g. of haemoglobin per 100 ml. of blood. Three separate series of comparisons have been made—two in the London laboratory and one in the Provinces under field conditions using a portable photo-electric colorimeter for the alkaline haematin measurements. The figures are set out in Tables II, III, and IV.

Discussion

The agreement between these results, both internally in each series of determinations and as between series, is good. The deviations from the average are well within the limits of error encountered in colorimetric methods. They are, indeed, surprisingly small in view of the uncertainties of matching in a dilution type of colorimeter (cf. Macfarlane, 1943), and it should be emphasized that it was possible to obtain reliable Haldane readings only by a rigid observance of Haldane's "titration" technique of colorimetric matching. The operator was ignorant of the reading of his matching in each case, since the value was observed and recorded by a second person. With proper precautions, therefore, it is possible to obtain satisfactory agreement between the Haldane and alkaline haematin methods, and with iron analyses of the blood. The agreement appears to be satisfactory whether the comparisons are made on the bloods of healthy persons, hospital patients, or industrial workers exposed to certain noxious chemicals. But it is improbable that the comparability would be as good with bloods containing a high proportion of methaemoglobin and sulphaemoglobin.

TABLE I.—*Comparison of Haldane Results with Iron Analyses on Normal Bloods (by $TiCl_3$ Titration)*

No.	Mg. Fe per 100 ml. Blood	B.S.I. Haldane Corrected Reading %	Mg. Fe/100 ml. eqv. of 100% B.S.I. Haldane
	A	B	C = 100 A/B
1	54·7	105	52·1
2	55·7	106	52·5
3	51·6	111	46·7
4	61·7	129	47·8
5	57·5	121	47·6
6	56·8	116	48·9
7	60·9	127	48·0
8	47·9	96	50·0
9	54·4	108	50·4
10	49·3	97	50·8
11	48·2	97	49·7
12	51·2	106	48·4
13	52·5	109	48·2
14	57·0	114	50·0
15	56·6	115	49·2
16	53·9	108	50·0
17	57·5	112	51·4
18	53·6	109	49·2
19	55·1	113	48·7
20	50·1	101	49·6
		Average	49·5
		Coefficient of variation (corr.)	3·02%

Note.—49·5 mg. Fe = 19·8 ml. O_2 and 14·8 g. haemoglobin.

TABLE II.—*Comparison of Haldane with Haemin Iron Results on Normal Bloods (by Alkaline Haematin Method)**

No.	Mg. Fe per 100 ml. Blood†	B.S.I. Haldane Corrected Reading %	Mg. Fe/100 ml. eqv. of 100% B.S.I. Haldane
	A	B	C = 100 A/B
1	54·4	105	51·8
2	55·0	106	51·9
3	52·4	111	47·3
4	63·9	129	49·5
5	60·2	121	49·7
6	59·3	116	51·1
7	62·2	127	49·0
8	47·5	96	49·5
9	54·2	108	50·1
10	48·8	97	50·3
11	48·8	97	50·3
12	52·0	106	49·1
13	53·0	109	48·6
14	57·4	114	50·3
15	56·1	115	48·8
16	51·9	108	48·0
17	56·1	112	50·1
18	52·0	109	47·7
19	54·4	113	48·1
20	48·3	101	47·9
		Average	49·5
		Coefficient of variation (corr.)	2·75%

* 1 ml. blood diluted to 100 ml. with N/10 NaOH.
† By comparison with haemin standard (haemin Fe equivalent of haemoglobin Fe = 1·3; cf. Clegg and King, 1942).

TABLE III.—*Haemoglobin Equivalent of B.S.I. Haldane Standard derived from Comparison with Alkaline Haematin Method*

Direct method (0·02 ml. blood for Haldane and 0.05 ml. for alkaline haematin):

No. of blood specimens	30
Av. eqv. of 100% Haldane	14·85 g. Hb (± 0·48)
Coefficient of variation	3·21%

Indirect method (0·2 ml. blood diluted to 10 ml. with N/20 NH_3: 1 ml. for Haldane, 3 ml. (+ 3 ml. N/5 NaOH) for alkaline haematin):

No. of blood specimens	32
Av. eqv. of 100% Haldane	14·82 g. Hb (± 0·38)
Coefficient of variation	2·53%

TABLE IV.—*Comparison of Alkaline Haematin and Haldane Results in a Field Survey*

No. of blood specimens	62
Coefficient of variation of Haldane* from alkaline haematin results	2·84%

* Haldane standard taken to be equal to 14·8 g. Hb.

The nearest average figure (to one place of decimals) for the B.S.I. Haldane standard is 19.8 ml. of oxygen or 14.8 g. of haemoglobin. How it has come about that this standard, which has been checked and re-checked over a period of more than 40 years, could have changed from an original equivalence of 18.5 ml. O_2 to the present 19.8 ml. is a perplexing problem. There can be little doubt of the reliability of the 19.8 figure, since this value has been arrived at independently by Macfarlane and O'Brien, who report the results of their measurements in the accompanying paper (p. 248). It is worth pointing out, however, that the Haldane gas apparatus has repeatedly been observed to give variable and low results for O_2 capacities of blood (van Slyke and Stadie, 1921; Abeloos, Barcroft, Cordero, Harrison, and Sendroy, 1928; Litarczek, 1928; Bierring, Nielsen, and Nielsen, 1936). Although Haldane O_2 results often agree with van Slyke results, disagreement is more common and the error may be as large as 9%. It should be particularly emphasized that a gas analysis of a single specimen of blood is not sufficient to set up a standard. For this purpose determinations should always be made on several specimens, and the colorimetric or photometric standard established by reference to the average of the results.

It has long been a matter of speculation as to why the "normal" of English bloods should be lower than that accepted in Germany and in America. Several reasons have been advanced (cf. Price-Jones, Dill, and Wright, 1931), but it has always seemed unlikely that any real difference in fact existed. Jenkins and Don (1933), as the result of a large series of van Slyke estimations, came to this conclusion; and we have observed during the war years that there is no appreciable difference between the haemoglobin concentrations of British, Canadian, and American soldiers whose bloods have been tested at this school. The present finding that the accepted standard of British reference for haemoglobin values is much nearer to Continental and American standards should serve to bring British haematological figures into closer alignment with results obtained elsewhere. Past recorded results should be reviewed in the light of this standardization figure.

Summary

The Haldane colorimetric standard recently defined by the British Standards Institution is equal to a haemoglobin concentration of 14.8 g. per 100 ml. or 19.8 ml. of oxygen. Haemoglobin results by the Haldane and alkaline haematin methods were in good agreement when the correction for the Haldane standard was applied.

This investigation has been carried out at the request of the Subcommittee on Analytical Methods set up by the Medical Research Council and as the result of an inquiry from the medical officers of the Ministry of Supply. Part of the expenses incurred has been defrayed by a grant from the M.R.C., for which we make grateful acknowledgment.

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According to the *Aftontidningen* of Sept. 8, 1943, there were in Germany 71,500 new cases of tuberculosis in the first half of 1943, as compared with 67,000 in the whole of 1939. It is considered that the number may be even larger in view of the difficulties prevailing for people who wish to report sick, and in view of the shortage of doctors, which has meant that not all those persons who are ill get medically examined. As a sidelight on these figures it is interesting to note that in Germany the health authorities last year announced that milk can no longer be delivered to households free from bacteria, and the population are therefore requested to boil milk for five minutes before using.

CADMIUM POISONING

BY

PHILIP ROSS, M.D.

Because of the modern widespread use of cadmium and its salts in industry it is becoming increasingly important to recognize the possible toxic effects of these substances, and as the literature on this subject is rather meagre the following observations may prove of assistance in industrial medicine.

Industrial Uses of Cadmium.—These are legion: the process of plating; the preparation of certain fusible alloys; the manufacture of specialized solders, dry batteries, paints, pigments, and metal bearings; and in the car and armaments industries.

Industrial Risks.—These occur during the smelting of ores, the preparation and flame-cutting of cadmium alloys, cadmium welding, electro-plating, and metal spraying. It is not universally realized that finely divided cadmium of a particulate size of 10 microns or less is inflammable, producing in the presence of abundant oxygen dangerous fumes of cadmium oxide. It is possible, too, that this cadmium dust is explosive.

Pathology of Cadmium Poisoning

As with lead and mercury, the main danger lies with the inhalation of the fumes of the pure metal or its salts. It is therefore essential, first, to guard against the production of free fumes in the workroom, and, secondly, where such an occurrence is unavoidable, to provide an efficient exhaust mechanism and ensure the wearing of a suitable respirator. The late Sir Thomas Legge (1923) described a fatal case of cadmium poisoning caused by the inhalation of fumes while melting ingots of metal. Post-mortem examination revealed widespread inflammation of the lungs, gastro-intestinal tract, kidneys, and spleen. Other observers have found, in addition, a slight polymorph leucocytosis; and the Canadian observers Bulmer, Rothwell, and Frankish (1938), while describing similar appearances, stress the fact that the lungs bear the brunt in all cases of cadmium fume inhalation.

Symptomatology

It would appear, then, that cadmium in a finely divided state is a powerful irritant poison, and though the lungs have been indicted as bearing the main burden of this onslaught, I would point out that the digestive tract shares with the pulmonary system the first line of defence. It must be emphasized that though the immediate effects are slight the delayed action is often severe and can even prove fatal—such catastrophes being described by Johnstone (1941) and others. We thus have a parallel to phosgene and other lung irritants of gas warfare. The following symptoms have been culled from current literature and from my own series of cases.

1. *Immediate Effects.*—These include smarting of the eyes, dryness and irritation of the throat, tightness of the chest, dyspnoea, cough, and feeling of prostration. A few have complained of giddiness and headache.

2. *Delayed Effects.*—These appear usually three or four hours after exposure. The earlier respiratory distress increases in severity; gastric disturbances make themselves manifest with nausea, retching, vomiting, and occasionally diarrhoea; metal fume fever is in frequent evidence, characterized by an attack of "ague" with rigors and pyrexia; prostration becomes marked; in the event of prolonged exposure pneumonia may supervene; and in fatal cases there may be signs of kidney and liver involvement.

Physical Signs.—In the moderate type of intoxication these are few. The patient is pale, dyspnoeic, prostrated, and inclined to retch; the pulse rate and temperature are at first normal. The pharynx is injected, no adventitious sounds are heard in the chest, but there is usually some epigastric tenderness. With the advent of "ague," rigors and pyrexia supervene. The serious case shows evidence of a diffuse bronchopneumonia best revealed by *x*-ray examination.

Treatment; Prognosis and Sequelae

Except where contact with the fumes has been slight and brief, cessation from work and complete rest in bed for at least

48 hours should be insisted upon. In mild cases the symptoms by that time will have subsided, excepting possibly some nausea, anorexia, and weakness. In severe cases more prolonged recumbency is necessary, treatment being symptomatic and carried out according to general principles: oxygen for marked dyspnoea, sulphonamides for pneumonia, and appropriate sedatives for the dry cough and gastric disturbances.

Mild cases recover in a few days; but when pneumonia ensues recovery is necessarily prolonged and disability may last for two months or more. In the few recorded fatalities death has occurred within ten days. Though it is stated that no permanent effects have hitherto been encountered I have noted the following residual symptoms at the expiration of two months: nausea, anorexia, weakness of the legs, slight dyspnoea on exertion, and epigastric tenderness.

An Analysis of 23 Cases

An outbreak of cadmium poisoning occurred recently in a factory to which I am attached. The mishap arose one Sunday morning at 10.30, when a workman, while cleaning out a cadmium-recovery chamber, dropped some red-hot ash from a lighted cigarette on the floor and ignited the cadmium dust deposited there. (The man was smoking, contrary to regulations.) As the metal was in a finely divided state (subsequent examination showed that the size of the particles was between 2 and 10 microns) it began to glow and soon became a red-hot mass emitting yellowish-brown smoke of cadmium oxide. Within a few minutes the wood and canvas filter-frames were blazing furiously. The fumes filled the shop very rapidly and affected in all 23 persons, the chief fireman bearing the brunt of the exposure for 30 minutes, while the rest were in contact with the smoke for not more than 20 minutes.

The *immediate effects* noted by the men were dryness of the throat, constriction of the chest, cough, and weakness of the legs. Two complained of irritation of the eyes, and a few others had headache and giddiness. They all, nevertheless, returned to their respective duties and attempted to resume work. Three, however, were unable to carry on and were allowed to rest.

Delayed effects began to manifest themselves about three hours later, when 10 men complained of nausea and epigastric pain severe enough to warrant attendance at the first-aid post, where they received palliative treatment from the trained nurse in charge. At this stage the dangerous nature of the fumes had not been appreciated, and it was assumed that the smoke had emanated solely from the burning filter-frames. Hence the men received stomach sedatives and were allowed to rest, but no alarm was raised.

I was apprised of the incident at 10.30 p.m. by the control officer, who became concerned at the continued disability among those who were still on duty, and the preliminary report to me included the information that a chemical extinguisher containing carbon tetrachloride had been used for a brief period at the onset of the fire. This led me to suspect delayed phosgene poisoning, and I arranged for the admission into hospital of those who had been seriously affected—eight in all. Subsequent exhaustive investigations, in which Dr. Middleton, the medical inspector of factories, co-operated, proved that the carbon tetrachloride played no part in the intoxication.

A Typical Case.—As the chief fireman was the most serious casualty I shall cite his symptomatology and progress as a "typical" case of poisoning. His early discomfort was slight—a feeling of dryness in the throat—but three hours later he complained of headache, nausea, vomiting, diarrhoea, and prostration, and he received attention at the first-aid post. Eleven hours after exposure he felt well enough to go home, and he refused assistance for this twelve-mile journey. He stated subsequently that his only clear recollection of this trip was the start, when he felt he was "walking on air"; but he was oblivious of the rest of the journey, nor did he remember being met by his wife at the destination. His sickness and diarrhoea continued for the rest of the evening, and I was informed that he had attacks of shivering also. He was admitted to hospital at midnight, July 11. His symptoms then were headache, dyspnoea, slight cough, dry throat, smarting of the eyes, vomiting, and diarrhoea. Examination revealed no cyanosis; breathing was rapid and laboured (rate 40 p.m.), the pulse 92, temperature 101°, and blood pressure 115/70. Both lungs showed generalized fine crepitations. A radiograph on July 13 disclosed shadows at both bases suggestive of patchy consolidation, and a repeat photograph four days later revealed slight clearing at the left base. The sputum showed no pneumococci or other pathogenic organisms, and investigations of the blood and urine were negative. He made steady progress with treatment, which included the administration of sulphamezathine. He was discharged for convalescence on July 26, and resumed work on Sept. 6, being restricted to light duties. He still complains of occasional headache, heaviness of the eyelids, and slight weakness of the legs.

The following table is a summary of the main symptoms displayed by the victims:

Symptoms	No. Affected
Irritation of eyes	2
Headache and vertigo	4
Throat irritation	6
Precordial constriction	21
Dyspnoea	21
Cough	9
Gastric pain, nausea, vomiting	16
Ague or fume fever	14
Pneumonia	1
Prostration	16

A survey of the incapacity caused by the accident shows that of the 23 men involved 7 lost no time, 4 were absent for one day, 3 for six days, and 1 for nine days. Of the more seriously affected, one was away for four weeks, another for seven weeks, and the fireman, who had pneumonia, was disabled for two months. One employee made a start but was unable to continue because of indefinite abdominal pains and anorexia; he is now away undergoing further investigations. These have shown that his abdominal symptoms had no organic basis and that there was no sign of cadmium poisoning.

Conclusions and Summary

Twenty-three cases of cadmium poisoning have been described.

The inflammability of finely divided cadmium has been emphasized and the dangers of cadmium fumes have been noted.

Nausea, epigastric pain, precordial constriction, dyspnoea, and prostration are fairly constant symptoms; and ague occurred in 14 cases.

The delayed action of cadmium intoxication is well illustrated.

No fatality occurred in this series.

Where the possibility of such fumes arises the worker must be protected adequately, by either an efficient exhaust system or a suitable respirator.

In the event of a fire in a department where cadmium is used the firemen must wear suitable respirators.

The rule "No smoking" should be strictly enforced where cadmium powder is present.

I wish to thank the factory management for permission to publish this report, also to express my appreciation of the co-operation of Dr. Middleton and Dr. Van der Walt.

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DRY BLOOD TEST FOR TYPHUS FEVER

PRELIMINARY REPORT

BY

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In 1942 Steuer utilized a slide agglutination method for the rapid diagnosis of typhus fever. He claimed that 200 slides could be examined in 90 minutes, and that each individual slide could be read in from 5 to 10 minutes. We found his technique unnecessarily cumbersome, and it was therefore modified by us to make it more workable for general use. The essential difference between the two techniques was that, while Steuer used *exactly* measured quantities of blood and antigen suspension, we used *approximate* quantities. The technique we employ is:

Method

Place on a clean glass slide two drops of blood, obtained by pricking the finger or the ear lobe without squeezing, separated from each other by a grease-pencil line. Dry in air and mark the drops 1 and 2. Place a drop of concentrated suspension of OX 2 and OX 19 on blood drops 1 and 2 respectively. Leave for a minute, and then complete the mixing of the blood and the suspension by gently rocking the slide. (Mixing with a platinum loop or othe

foreign object tends to produce strings of fibrin, which cause confusion in reading the results.) Set aside for five minutes, taking care to avoid drying up of the slide and soiling by dust. Rock the slide occasionally.

Results are read in from 5 to 10 minutes by the naked eye, and if necessary are confirmed by a hand-lens. The use of the low-power objective, as recommended by Steuer, is rarely necessary.

Results

The tests were carried out on Egyptian labourers. Slides were taken in various camps under military control, were brought to the laboratory the same day, and were examined within the next 24 hours. In all, 640 persons were examined; 11 of these gave "slide-positive" results against OX 19, and 2 were positive to OX 2 in addition. These 13 were then followed up by a complete Weil-Felix reaction, using Dreyer's technique. The results are summarized in Table I.

TABLE I

Positive to OX 19	7*
Negative ,,	6

* Of these 7 positives, 2 also showed agglutination in 1/50 against OX 2; and these two were the same persons who were slide-positive for OX 19 and OX 2.

The seven "slide- and Dreyer-positive" cases were further studied by carrying out a series of Weil-Felix tests at 4-day to 7-day intervals. The results obtained are shown in Table II.

TABLE II

Serial No.		1st Test	2nd Test	3rd Test	4th Test	Remarks
3	OX 2 OX 19	0 250	50 250	— —	— —	Had typhus a month before first test
4	OX 2 OX 19	50 50	50 125	50 500	— —	Not traceable afterwards
12	OX 2 OX 19	50 500	— —	— —	— —	Had typhus 3 weeks previously in hospital
19	OX 2 OX 19	0 500	— —	— —	— —	Not traceable: history not available
20	OX 2 OX 19	0 1,280	0 2,560	— —	— —	Hospital case: diagnosed typhus
21	OX 2 OX 19	0 250	0 1,800	— —	— —	Typhus with rash
22	OX 2 OX 19	0 250	0 250	0 1,250	0 1,250	Typhus with rash

Nos. 4 and 19, despite the history being unobtainable, should be considered typhus cases in view of the high titre. The others were definite typhus cases. It will thus be seen that all the clinical and Weil-Felix-positive typhus cases showed "slide agglutination" as well.

The results of the six slide-positive and Dreyer-negative cases (see Table I) are detailed in Table III.

TABLE III

Serial No.:	1	2	7	13*	15	17
OX 2	0	0	0	0 0	0	25
OX 19 ..	0	0	0	0 0	50	50

* Done twice, at five days' interval.

Except in two cases, there was no agglutination by Dreyer's method, and in neither of these was the titre high enough for diagnosis. These observations suggest that negative cases may occasionally give positive results, but this is not of much import. The fact that every clinical typhus case which was proved positive by the Weil-Felix reaction was spotted by the slide method is justification enough for urging the use of this simple technique as a preliminary to putting up a long series of tests by Dreyer's or Felix's method.

It was decided to try out a number of slide-negative cases by Dreyer's method, to see whether the zone phenomenon or some other factor would produce positive results in slide-negative cases. Thirty-three such sera were tested; the highest dilution put up was 1 in 250 and the lowest 1 in 25. Of these, 25 were completely negative; the remaining 8 gave agglutinations as shown in Table IV.

TABLE IV

Serial No:	25	27	29	33	35	45	50	52
OX 2	0	25	0	50	25	25	0	25
OX 19	25	0	25	0	25	0	25	0

None of these titres has any diagnostic value.

It is reasonable to conclude from these results that a slide-negative blood will not give a positive Dreyer reaction—certainly not of any diagnostic value. The low titres given in Table IV have no significance beyond perhaps the possibility that the individuals had developed some immunity as a result of subclinical infection, or had suffered from the disease some time previously.

Comment

Having established that all positive cases can be detected by the slide method (of course to be confirmed by a complete agglutination test), and that the slide-negative cases will not give a positive result by Dreyer's method, it is a reasonable assumption that a complete Weil-Felix test need not be done unless the slide test is positive. If this procedure is followed the obvious advantages will be: (*a*) economy in material and time; (*b*) avoidance of unnecessary bleeding of the patient; and (*c*) easier dispatch of slides, as compared with that of blood or serum, to a laboratory situated at a distance from the hospital. Probably the test could be done on thick smears of blood, similar to those used for the detection of malaria parasites, and taken at the same time.

Summary

A dry blood test for typhus has been tried out among Egyptian civilians.

It has been shown that all typhus cases give a slide-positive result, though a slide-positive result does not necessarily mean a positive case.

Control tests show that a negative slide will not give a positive Weil-Felix reaction.

The need for trying out this method on a more extensive scale is urged, and the advantages to be derived therefrom are discussed.

We thank Mr. A. C. Lahiri for his help in recording our results and with the typescript.

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Medical Memoranda

Vaginal Ulceration and Vitamin C Deficiency

During the past six months several patients attending the gynaecological clinic at the Radcliffe Infirmary with acute ulceration of the vagina were given doses of 300 to 500 mg. of ascorbic acid daily while investigations were proceeding to determine the aetiology of the ulceration. Healing occurred rapidly without further treatment. With this in mind it was decided in future to investigate the level of the blood ascorbic acid before starting treatment. The following cases are therefore of interest.

CASE I

A single woman aged 34, in apparently good health, complained of pain and discomfort on micturition and a continuous blood-stained vaginal discharge for one month. There were two small areas of ulceration on the inner surfaces of the labia minora and an additional area on the vault of the vagina. They had the punched-out appearance of syphilitic ulcers and the acute tenderness of tuberculous ones. There was no surrounding induration, smears and cultures failed to reveal either treponema or gonococci, and the Wassermann reaction was negative. Biopsies showed no evidence of epithelioma and nothing suggestive of gonococcal, tuberculous, or syphilitic infection. The urine was sterile and there was no glycosuria. Haemoglobin amounted to 98%, the red count was 4,900,000, and the leucocyte count 10,000. The blood ascorbic acid level was 0.04 mg./100 ml. The normal wartime level as found in a control series of apparently healthy persons was 0.4 mg./100 ml. (J. R. P. O'Brien—personal communication).

In view of these results the patient was questioned on her diet, and it was found to be unusually lacking in green vegetables and fruit. The main meal of the day was taken in the canteen of a munition factory. Ascorbic acid mg. 150 t.d.s. was prescribed for three days, and mg. 100 t.d.s. for a further month. The ulceration had completely disappeared five days after starting treatment. There

has been no recurrence after six weeks. The blood ascorbic content rose to 0.84 mg./100 ml.

CASE II

A healthy-looking married woman aged 38 complained of "acute pain in the front passage" a few days before menstruation and severe dysuria for four months. Owing to extreme pain and tenderness sexual intercourse for the previous four months had been impossible. On examination there was a condition of granulomatous ulceration, involving the vaginal introitus, the suburethral angle, and the fourchette. There were also minute shallow ulcers within the vagina. Smears and cultures revealed no evidence of gonococcal or treponema infection. The Wassermann reaction was negative. Biopsies showed benign non-specific ulceration. The blood picture was normal; the urine was sterile and sugar-free. The blood ascorbic content was 0.26 mg./100 ml. Ascorbic acid mg. 150 t.d.s. was prescribed for three days and mg. 100 t.d.s. for a further four weeks. All ulceration disappeared in six days and the blood ascorbic content rose to 1.2 mg./100 ml. There has been no recurrence after five weeks.

These cases have reminded one of us (M. K. L.) of similar vaginal conditions seen among West African natives and recognized as due to an avitaminosis. Varying degrees of avitaminosis produced varying degrees of vaginitis, ranging from a mild irritation with no pain to excoriation with painful ulceration. Treatment with marmite, tomato juice, and citrous fruits was always successful.

The above cases were investigated and treated while under the care of Mr. J. A. Stallworthy, by whose kind permission we publish them. The ascorbic acid used was the preparation redoxon, supplied by Roche Products Ltd.

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Anaphylactic Shock after Posterior Pituitary Extract Injection

The following unusual and alarming reaction to pituitary extract seems to justify publication.

CASE HISTORY

An unmarried woman aged 32 was under my care two years ago for menorrhagia lasting from eight to ten days at each period. She improved after treatment with progestoral tablets and calcium injections. In Oct., 1942, she had another menstrual haemorrhage; it was so severe that she was unable to carry out her work, and came to me for immediate help. I injected intravenously 10% calcium "Sandoz" and a mixed injection of 1 c.cm. of posterior lobe pituitary extract (glanduitrin Richter) plus 1 c.cm. of neofemergin intramuscularly. Within a few minutes she complained of severe pains in the head, a feeling of apprehension, and blurred vision. She had an attack of coughing, and said that she could not breathe and that the tongue felt swollen. At this stage I could actually see the eyelids, nose, and lips swelling, and the skin of the body was covered by an erythema and was hot to the touch. She also complained of retrosternal pains. The pulse was irregular and accelerated up to 140. There followed pains in the epigastrium and later in the lower abdomen. At this stage the nose became blocked, the eyes were running, and vomiting began. During all this time the patient was unable to speak, although she was not unconscious; I gave her 2 c.cm. of nikethamide (coramine) hypodermically. A few minutes after the injection her condition improved; the pulse became steadier and the rate decreased to 120 and later to 100, but tachycardia persisted until the following day. After the nikethamide injection large quantities of very frothy fluid were vomited and the breathing became easier. All the symptoms began to clear up; the swelling of the face was greatly improved, and the exanthema faded gradually. Itching of the feet, swollen eyelids, and head pains remained throughout the following day. The patient was able to go home five hours after the onset. One week later a slight irritant rash appeared on the side of the injection.

A noteworthy fact in her past history is that she had urticaria after eating fish during childhood. The picture resembled, to a certain extent, anaphylactic shock after serum injection.

COMMENTARY

During 17 years' practice I have given several thousand injections of pituitary extract and ergotin, either alone or mixed, and I have never seen a similar reaction; moreover, on discussing this with colleagues I have found no one else who has seen a case like it. The question arises whether this reaction was provoked by the pituitary extract or by the neofemergin, which contains ergometrine. Chassar Moir (1936) reported a few cases of unusual reaction to ergometrine, and considers the possibility of a rare idiosyncrasy to that drug, but his cases showed a different appearance. Their faces were grey and covered with sweat; there was no sign of glottis or pharynx oedema, no rash or itching. It seems to me that the case I have described was due to the presence in the pituitary extract of some traces of protein or to hypersensitivity to pituitary extract produced by some other unknown substance. The picture of pituitary shock which sometimes occurs in patients is clinically characterized by pallor, increased pulse rate and fall of blood pressure, headache, and occasionally abdominal pains, nausea, and vomiting. These symptoms are due to capillary vasoconstriction and coronary spasms, and they differ from those I have described here.

I found very little explanation in the literature. Simon and Ryder (1936) reported five cases of hypersensitivity to pituitary extract in patients with a family or personal history of allergy, but all had been sensitized by previous pituitary injections, whereas my patient had never before had an injection of pituitary extract. These authors made skin tests with different extracts, and showed that the sensitivity is not limited to one particular brand of extract and is not due to vasopressor or oxytocic factors but to some constituent of the gland. Sullivan and Hefferman (1942) describe three different varieties of toxic reactions following the use of pituitary extract: (1) pituitary shock; (2) pituitary reaction resembling true anaphylactic shock; (3) more rare tetanic convulsions with either a rise or a fall in blood pressure.

Although conclusions cannot be drawn from one case, it seems advisable to avoid pituitary extract injections in cases with a history of allergy and to give only small doses if a patient has previously had the extract, until it is certain that there is no hypersensitivity.

London, W.1. E. SCHLEYER, M.D.Vienna, L.R.C.P.&S.Ed.

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A Case of Cavernous Sinus Thrombosis

The following case is of interest as an addition to the number of recorded recoveries.

CASE HISTORY

A boy aged 14 struck the region of his left eyebrow on a door-handle. On account of soreness of the part he attended hospital two days later, but no abnormal signs were then evident except for a slight skin abrasion. The following day the eye began to become prominent and the temperature mounted to 103°, and on admission that evening there was gross left proptosis with chemosis as of an orbital cellulitis. The next evening the other eye became equally proptosed, and the day after that the whole face was grossly engorged. By that time he was vomiting, was doubly incontinent, and had become semi-comatose. This state lasted a week, during which time the fever remained around 103°; then gradual recovery ensued, with decongestion of the face and a return to continence and consciousness. On the 5th to 8th days after admission there were attacks of tremors affecting all muscles of the face, and to a lesser extent the arm, on one or sometimes both sides; these lasted a few minutes and occurred several times a day. No fundus changes were evident except slight engorgement of the retinal veins and doubtful blurring of the optic disk margins, especially on the left side (the side first affected). On his return to consciousness a residual left facial palsy was observed, clearing in about a fortnight. There were also stiffness of the right leg with extensor plantar reflex, and left external rectus paresis, which disappeared in a few days. His convalescence was delayed by a mild basal pneumonia and a small subcutaneous orbital abscess. Vision was 6/5 right and left.

Treatment included administration of sulphapyridine, which could only be given intramuscularly after the second day, and later sulphadiazine by mouth—32 g. in the first week (1 g. 4-hourly for 2 days, then 6-hourly for 5 days) and 21 g. in the second week (1 g. 3-hourly). Four pints of glucose-saline 5% drip transfusions were necessary while he was incontinent, vomiting, and unable to take fluids by mouth.

COMMENTARY

Cavernous sinus thrombosis has been regarded as a uniformly fatal disease: in 1936 a 100% mortality was recorded in a survey of literature by Grove. With the advent of the sulphonamides, however, some 12 cures have been effected. In at least 3 cases, in conjunction with sulphathiazole, heparin has been used with success for the prevention of any extension of the clotting; in addition staphylococcal antitoxin is recommended even where (as in this case) the blood culture is negative and no adjacent furuncles can be incriminated; since before the sulphathiazole takes effect there is a lag period in which the antitoxic agent is of great value.

In this case the infection presumably reached the orbit from a nasal sinus through a fracture of the intervening bone, although this could not be shown subsequently on an *x*-ray film. The meningeal irritation producing localized tremors, and the residual palsies, are a frequent accompaniment, and confirm the diagnosis. Retinal changes have rarely been severe in those cases which have recovered.

I am indebted to Mr. P. G. Doyne and Dr. S. P. Meadows for permission to record this case.

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Reviews

HUMAN BIOLOGY: THE PECKHAM EXPERIMENT

The Peckham Experiment: A Study of the Living Structure of Society. By Innes H. Pearse, M.D., and Lucy H. Crocker, B.Sc. (Pp. 333. 12s. 6d. net.) London: George Allen and Unwin, Ltd. 1943.

The Pioneer Health Centre at Peckham took shape in 1926, when a small house was occupied in South London with a view to offering to the families of the neighbourhood a health service built up on the pattern of a family club, with a periodical health overhaul for all its members, and with various services for infants, children, and parents alike. In 1935 it entered into possession of a modern building, specially constructed and equipped as a "laboratory for the study of human biology." The amenities of the Centre were intended for families within walking distance, so that it was a local enterprise, but with the literature which it is accumulating Peckham may well come to stand not for a suburban habitation but for an idea, and a very fertile one at that. *The Peckham Experiment*, the writing of which has been made possible by a grant from the Halley Stewart Trust, is the third of four books on the subject. The first two—*The Case for Action* and *Biologists in Search of Material*—appeared in 1931 and 1938, and the fourth, to be entitled *Science, Sanity, and Synthesis*, is to follow. The present work, by two women, Dr. Innes Pearse and Miss Lucy Crocker, both of whom have had social experience in the East End of London, is not a description of the Peckham Centre, with some general conclusions to be drawn from its work; rather it is an essay on human biology with illustrations derived from Peckham. It deals wisely and penetratingly with the subject of the family, which is the unit of the Centre's operations, and it discusses the phenomena of courtship and mating, the bringing up of children, and social poverty and sufficiency in a way which is scientific and original, but never losing sight of the human subject in the mass of biological material. Perhaps that is because the authors are not writing out of the void, as it were, but on the solid basis of the work at the Centre, with its manifold activities and its human interest.

Falling in love is a theme which has suffered alike at the hands of romancers and cynics; but these trained biologists manage to deal with it understandingly and sympathetically. The growing pains of adolescence can hardly ever have been better described than in Chapter XI. Another fundamental idea of the Centre, which is reflected in these pages, is the importance of the father, that neglected shadowy figure in all maternity and child welfare organization. The Centre introduces him into the parental consultations; his presence there is made to appear a matter of easy and natural routine, so that instead of being a shy and anxious spectator of his wife's pregnancy his attitude is likely to become one of intelligent interest and active partnership, without any sneaking regret for what has happened or any dread of what lies ahead. Peckham affirms that pregnancy is a condition in which Nature has destined woman to be at her best, that there is no basis for the relegation of the pregnant woman to the position of "patient" to which modern civilization has condemned her, but it adds that in all parenthood from its very beginning the role of the father as well as of the mother as a specialist in the nurture of their child is of the utmost importance to the family as a functional unity. Peckham deserved a book, but this volume deserves a multiplication of Peckhams.

BRONCHIECTASIS

Bronchiectasis: Pathogenesis, Pathology and Treatment. By James R. Lisa, M.D., and Milton B. Rosenblatt, B.S., M.D. Oxford Medical Publications. (Pp. 190; illustrated. 21s.) London: Oxford University Press. 1943.

This book, by two American authors, is badly conceived, being either too long or too short. It is written to review current ideas on the pathology and pathogenesis of bronchiectasis, describe the pathological findings in 110 cases studied by the authors, and elaborate their conclusions as to its cause. The book opens with a chapter on the anatomy of the bronchi, and includes others on the symptoms and treatment of bronchiectasis. These occupy one-third of the contents, and could well have been either omitted or amplified. They contain little that is unfamiliar to the reader who will be interested by the main subject in the book, but are not comprehensive enough for a textbook on bronchiectasis.

The authors examined the lungs of all cases that came to necropsy at the City Hospital, Welfare Island, in 1939; those (110) showing evidence of bronchiectasis were cut serially and the sections were stained by various methods. A clear description of the findings, with many photomicrographs, is given. The authors found that a similar infective process existed whatever the associated condition of the lungs. They then describe their theory of the pathological sequence of events, and conclude that the disease is always basically due to an infection, atelectasis and other suggested causes being either coincident with or adjuvant to infection. This theory is attractively argued, but the objections to it, though mentioned, are not completely met. A useful list of references to the authors quoted is given, but it is confined to workers in either Britain or America.

The book can be recommended to those who are interested in the pathogenesis of bronchiectasis as a valuable contribution to its study.

BRITISH MEDICINE

Medicine in Britain. By Hugh Clegg. British Life and Thought, No. 17. (Pp. 46; illustrated. 1s.) Published for the British Council by Longmans, Green and Co.

When Mr. Seward, fishing for an acknowledgment that Johnson had himself written Dodd's *The Convict's Address to his Unhappy Brethren*, said that it had more force of mind than any of Dodd's earlier works, the doctor sharply rejoined: "Depend upon it, Sir, when a man knows he is to be hanged in a fortnight it concentrates his mind wonderfully." To be required to tell in fifty pages the whole story of *Medicine in Britain* and to make clear to a foreigner the evolution and prospects of our heterogeneous system may not be so grim a prospect as a journey to Tyburn, but could not be performed tolerably without great concentration of mind. Dr. Clegg has performed it admirably. In his historical sketch he makes our individualism and resentment of central control so clear that a foreigner will not be puzzled by the existence in a small island of 24 licensing authorities—though he may still be perplexed by the social custom which requires a surgeon to eschew the prefix "Dr.," however ample his academic claims to the title.

In describing present conditions and aspirations Dr. Clegg cannot avoid controversial topics, and writes dispassionately without being dull. The following passage seems to us admirable: "In view of the intimate nature of the patient-doctor relationship, the medical profession believes that the patient must have the right to choose and to change his or her doctor, and that the doctor may have the right to refuse to continue looking after a certain patient. In this, it is the freedom to change rather than to choose which is important." To a critical foreigner—conscious of the motes in others' eyes—the battle-cry "Free choice" seems an example of "British hypocrisy." Whoever, he may say, ever had or could have free choice of doctor; even Marcus Aurelius could not, or did not, enforce his free choice of Galen? We know what we mean, but the last sentence in the passage quoted is required by a foreigner. Whether there might not be freedom to change under many systems is another story. Dr. Clegg is not a propagandist, and criticizes our system. Sometimes he is even a little harsh. He writes: "On the whole it cannot be said that the Ministry of Health has been as progressive as the most progressive of the local health authorities—such, for example, as the Middlesex County Council and the London County Council. Its activities as a forward-looking health authority have suffered as a result of fluctuations in general policy—a disadvantage suffered by all centralized authorities subject to political influence and change. Nevertheless during the present war the Ministry of Health has taken a very much more active part in promoting the health of the people than it has done in the past." Until the present war the Ministry of Health had not the power to be progressive in the way that a local authority could be progressive, precisely because it was *not* a local authority. We think nearly all foreigners and a good many Englishmen could learn a great deal from this excellent booklet.

DISORDERS OF THE MIND

The Nature and Treatment of Mental Disorders. By Dom Thomas Verner Moore, O.S.B., Ph.D., M.D. Foreword by Edward A. Strecker, M.D. (Pp. 312. $4.00.) New York: Grune and Stratton. 1943.

This study comes from the Catholic University of America, and naturally shows signs of the special attitude of mind, both of psychiatrists and of patients, which is inseparable from the profession of the Roman Catholic religion. In the author's view mental disorder is essentially a psychological problem, and in his introductory chapters he is inclined to deny any relationship with the anatomy and physiology of the central nervous system, though later he refers to physiological changes in the hypothalamic area causing emotional expression and even changes of mood, and suggests that such physiological changes may explain the inappropriateness of much psychotic emotion. It is shown that Kraepelin's contention that definite clinical syndromes of mental disease may be described can be mathematically confirmed.

The author next considers the factors on which psychoses depend, and the theories of Freud, Jung, Adler, and Alexander are briefly described and examined. He then shows how emotional states can start and maintain organic changes through the autonomic system. He instances isolated emotional shocks apparently determining psychotic breakdown, but considers that there is always a pre-existing disposition, and points out that there is usually an interval of "brooding" between the emotional incident and the onset of the psychosis.

He considers that chronic emotional stresses may determine mental disorders, but does not believe that direct sexual factors such as celibacy, continence, or masturbation themselves contribute. He takes the "phobia" as a useful field of study. He points out that these are not always sexually determined. Childish fears do not always develop into phobias, and may be dissipated by wise home handling. Even phobias may spontaneously disappear in fortunate circumstances, but examples are given in which phobias are retained because they are consciously or unconsciously useful to the patient.

Under the section on treatment the successful analytic treatment of a case is described, and the success of simple free association is recorded in another case. The author illustrates the usefulness of psychotherapy in psychosomatic diseases, and points out how religion (Catholicism) and simple talks may be of great service, quoting as examples cases of marital disharmony and the problems of the unwanted and over-protected child. He refers to the usefulness of play therapy, the reorganization of the family and school relationship, drawing attention to emotional retardation as opposed to backwardness. He thinks that "bibliotherapy"—the choice of appropriate books for the patient to read—may be of great use. He illustrates how the rapid elimination of hysterical symptoms in children by counter-suggestion may clear up the whole psychoneurotic situation. Since emotional states can be induced by physiological changes in the hypothalamus, he maintains that drug treatment may well be useful, and refers especially to convulsive therapy by insulin, metrazol, and electrical methods, to hyperpyrexia and the administration of adrenal cortex and pituitary hormones. There is an appendix on the classification and definition of the clinical entities of psychiatry.

This work is well illustrated by case records, but contains nothing very new or original, and the up-to-date British psychiatrist will find the book interesting reading but will probably conclude that he has heard it all before.

Notes on Books

Dr. J. H. WOODGER'S *Elementary Morphology and Physiology for Medical Students*, which he aptly describes as "a guide for the first year, and a stepping-stone to the second," has reached a third edition (Oxford University Press; 15s.). This issue is distinguished from its predecessors by a well-illustrated chapter entitled "A Digression on Insects." Taking the American cockroach (*Periplaneta americana*) as exmplifying the principal features of a typical insect, he describes this one example in sufficient detail to enable a student to grasp the essential features of the structure and function of the various parts and organs of the order Insecta as a whole, and also to follow descriptions of those of medical importance, the more important of which are briefly noted at the end of the chapter. With full appreciation of the difficulties imposed by limitation of space in writing an elementary textbook, one would have liked to see greater stress laid upon the essential part played by response to environmental changes in both plants and animals, and to the undeniable evidences of the inheritance of modifications of structure and function which have been produced by climatic, parasitic, and other changes in environment causing either evolution or regression. In considering modern developments of the Mendelian theory, some of which rest upon assumption, there seems to be a tendency to place undue importance on the levelling influence of amphimixis on chance variations, while the causes concerned in the production of these variations are apt to be lost sight of. Bearing in mind the importance of a sound knowledge of heredity for the medical practitioner, we think that the value of the bibliography at the end of the book would be greatly increased if there were included in it—along with references to the standard works of Darwin, Wallace, and others—the names of a few special short works which give the essential points of the main theories in a small compass.

Preparations and Appliances

A PERITONEOSCOPE

Mr. GERALD OVENS, F.R.C.S., writes from St. Bernard's Hospital, Southall, Middlesex:

The value of peritoneoscopy as an additional method of diagnosis in obscure abdominal lesions is being increasingly recognized; but two factors—expense and the difficulties of obtaining a suitable instrument at the present time—have largely prevented its more widespread use in this country.

I am indebted to Mr. Schranz of the Genito-Urinary Manufacturing Company for designing for me a simpler and cheaper instrument which, while not intended to replace the Ruddock peritoneoscope, has in practice been found of great value in differential diagnosis and in assessing the operability of abdominal tumours.

The expense of all these endoscopic instruments lies chiefly in the optical portion. This peritoneoscope has been designed for use with the standard telescope supplied in H.M. Government cystoscopic sets, which thus becomes interchangeable, but it can readily be built to fit any telescope provided. It consists of: (1) A cannula with air inlet cock and trocar (Fig. 1). (2) A sheath similar to that of an examination cystoscope carrying a lamp at the distal end, and the usual connexion adjacent to the valve chamber (Fig. 2). (3) A standard 90° telescope (Fig. 3).

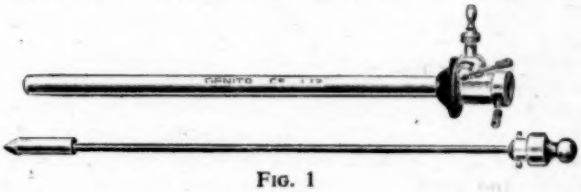

FIG. 1

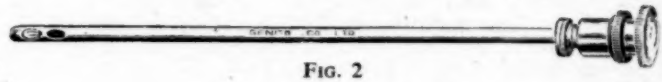

FIG. 2

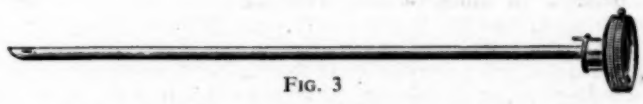

FIG. 3

The diameter of the sheath is slightly smaller than the lumen of the cannula, leaving sufficient space for the passage of air. It is held in position by means of an adapter which can be locked to the cannula.

In using the instrument a pneumoperitoneum is first induced under local or general anaesthesia by means of an ordinary artificial pneumothorax induction needle. The trocar and cannula are then inserted and the trocar removed. The adapter is locked to the cannula and the telescope and sheath inserted through it. A slight tightening of the locking device secures an air-tight joint. Bellows are now attached to the lateral connexion on the cannula, which is provided with a tap so that when sufficient air distension has been obtained the bellows may be discarded.

The instrument may be obtained from the Genito-Urinary Manufacturing Company, 28A, Devonshire Street, W.1.

TUBERCULOSIS IN WALES

The latest annual report of the King Edward VII Welsh National Memorial Association includes an address which its president, Lord Davies, delivered at the annual meeting.

Lord Davies referred in particular to the two important measures which have been taken in combating tuberculosis—namely, mass miniature radiography and the payment of maintenance allowances to dependants of persons suffering from pulmonary disease. Public opinion in Wales, he said, had been ready to welcome and utilize mass radiography for some time past. In 1941 the association approved an experimental scheme for the provision of mass radiography apparatus suitable for the conditions prevailing in Wales, including a vehicle for transporting it around the country. The initial cost of £5,500 was sanctioned by the Welsh Board of Health, but there had been some delay in securing the apparatus, and at the time he spoke its delivery in this country was still awaited. Meanwhile, the Ministry's set, although much less mobile than that which the association designed and ordered for itself, would be most useful in large centres of population in Wales. With regard to financial grants, Lord Davies drew attention to a leaflet (amplifying the model leaflet suggested by the Ministry) issued by the Flintshire County Council, pointing out that allowances were made under the Government scheme for pulmonary tuberculosis only, but that the county council provided additionally for all types of tuberculosis, and that the Government allowances would be operated as part of the county council's existing after-care scheme for pulmonary and non-pulmonary tuberculosis. He added that in Flintshire, out of 67 applications for assistance considered at a recent meeting of the Care Committee, 49 were found to be outside the Government proposals, thus showing the need for a fully effective care scheme in every area in Wales. Lord Davies referred to the National Memorial Association's plans for the future, temporarily postponed by reason of the war, which include the provision of additional beds at the tuberculosis hospitals, a new and enlarged research laboratory at Cardiff, modern clinics in all the large centres of population, an adequate and uniform health visiting service throughout the Principality, an extension of health education, and the establishment of a village settlement or settlements for the training of patients in suitable occupations. The treatment of chronic pulmonary disease as it affects coal-miners in Wales is at present under consideration.

Reports of Societies

HAND INJURIES

At a meeting of the Association of Industrial Medical Officers in January the chairman, Dr. J. C. BRIDGE, presiding, Mr. R. M. HANDFIELD-JONES and Dr. P. H. JAYES opened a discussion on injuries, infections, and burns of the hand.

Mr. HANDFIELD-JONES said that the commonest minor injuries affected the distal segment of the finger. As fibrous trabeculae divided the pulp of the finger into a series of narrow compartments, operation for drainage of a pulp infection, to be effective, must open all the infected compartments at once. A pure pulp infection must be differentiated from lymphangitis: in the latter incision was contraindicated, and each patient should be regarded as a potential fulminating case and be put to bed with the arm raised to 45 degrees, local antiphlogistine and early massive doses of sulphanilamide being given. Tendon-sheath infections were serious in that complete return of function could never be guaranteed. Early incision was essential. Infection of the palmar spaces caused swelling and tenderness of the palm. The swelling when the middle palmar space was involved was not so noticeable as the "ballooning" in the case of the infection of the thenar space. These infections were usually caused by spread from others, and were rarely direct. Patients with injuries of the hand, especially compound fractures, should be treated as in-patients. The wounds, having been cleaned, should be filled with sulphanilamide powder, loosely stitched, and subjected to some form of traction. Early active movements were essential. It was much easier to avoid a stiff joint than to loosen a joint which had been allowed to become stiff. Position in treatment was often important. The oedema could be minimized by raising the arm on a wooden frame; to have it lying on a pillow was not enough. If a stiff joint appeared inevitable the hand should be kept in the proper position for function, as stiffness in an unsuitable position gave an unsightly and useless hand. By suitable splinting support and the intelligent use of elastic traction deformities and stiffness of joints might be avoided.

Dr. P. H. JAYES said that treatment of burns of the hands depended on the facilities available and on the nature of the case. As a general rule burns of first or second degree were not much trouble, and whatever treatment was adopted full function usually resulted. Third-degree burns of the hands raised many problems of treatment. Skin grafting was often necessary to attain a full functional result. Coagulants did not as a rule give the best results on account of constriction of the fingers and consequent interference with blood supply, caused not only by the coagulum but by the oedema so commonly present beneath it. The coagulum was often so stiff that it splinted the finger for many weeks; the stiffness was difficult to overcome at a later stage. The saline bath was used for all severe burn cases. Efforts were made to prepare denuded areas for skin grafting at an early stage. Dressings were soaked off in the bath and the parts were exercised by active movements at the same time. After drying, the burned area was powdered with sulphanilamide and covered with tulle gras, with a moist saline compress over it. Most cases were skin-grafted by the end of three weeks. It was important to be sure that the denuded area was free from haemolytic streptococci. If the swab was positive grafting was postponed and efforts made to sterilize the skin by the local use of sulphanilamide and propamidine. Dr. Jayes stressed the importance of keeping the hand moving while waiting for grafting. If joints had been opened and stiffness seemed almost inevitable, the joint should be kept in the position of election for optimum function. Cases seen at a late stage with contractures due to tight scars could often be improved by dissecting away the scar and replacing it by Thiersch grafts. In some cases a full-thickness skin graft from the abdomen was necessary. First-aid treatment for burns should be as simple as possible, and in many cases covering with a sterilized dressing was sufficient. At hospital the area was carefully cleaned up under aseptic conditions; CTAB detergent solution was used for this. Blisters and loose skin were trimmed away, and the whole of the area was covered with sulphanilamide powder, tulle gras, and saline compress.

Dr. D. W. Winnicott recently addressed a meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health on the significance of psychology in infant welfare work. He stressed the mother's intuitive understanding of her child and her appreciation of the importance of the infant feelings to the infant, the intensity of those feelings, and the reality of infant distress. He suggested that if many things which the ordinary good mother knew intuitively were accepted by doctors there would be no interference with any mother–infant relationship except where absolutely essential, and much unnecessary harm would be prevented.

The Colonial Office announces that a new campaign is to be launched in the South-West Pacific against the *anopheles* mosquito, which, if introduced to the British islands at present free from infection, could cause as many casualties as combat warfare. This scheme is to be financed under the Colonial Development and Welfare Act, 1940, and an initial grant of £65,000 to cover three years has been made for the purpose. The *anopheles*, and consequently malaria, have hitherto been unknown in the territories of Fiji, Tonga, the Cook Islands, the Loyalty Islands, New Caledonia, the Gilbert and Ellice Islands, and Samoa. In the islands to the west of Fiji, on the other hand, malaria is widely distributed. In peacetime, when there was little shipping traffic between the islands and air services were unknown, the danger of the spread of infection was small, and the routine malaria control was considered sufficient. But since the outbreak of war, the establishment of large garrisons and the increase of air and sea traffic between the islands have greatly increased the danger of introducing malaria to the "clean" islands. A start is to be made with entomological surveys near shores and ports, and reconnaissance surveys of all potential breeding-grounds. Normal antimosquito work will be intensified and danger-places will be cleared, drained, and oiled. At the same time an engineer will prepare a scheme for mosquito control on a long-term basis.

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DAYLIGHT AND DUST

It has been known since Kirstein's[1] extensive experiments in 1902 that certain pathogenic bacteria, particularly members of the respiratory group (for example, tubercle and diphtheria bacilli, streptococcus, and pneumococcus), may, after natural drying, remain alive for many days or weeks. However, Flügge's[2] earlier work showing the limited range of infective droplets expelled by consumptive patients during coughing and talking, together with the difficulty experienced in infecting guinea-pigs with dried tuberculous sputum, led to a general acceptance of the dictum that the spread of respiratory infections occurred predominantly by the spray or droplet method, which requires close contact between infective and susceptible persons. In recent years there has been a renewal of interest in the possibility of dust-borne infection; but, in spite of much laboratory evidence that the dust in scarlet fever, diphtheria, and ear-nose-and-throat wards may contain many millions of haemolytic streptococci or diphtheria bacilli, clinicians have been unwilling to believe that dried "emasculated" bacteria are capable of initiating infection. In actual fact Buchbinder and his colleagues[3] have shown that naturally dried streptococci do not suffer any loss of virulence or attenuation in any other of their activities. Absolute proof of the infectivity of dust is not easily obtainable, but there is now a considerable body of circumstantial evidence in support of this view. Thus White,[4] after sweeping out a cubicle vacated three days earlier by a puerperal patient infected with a particular serological type of haemolytic streptococcus, herself developed a tonsillitis due to a streptococcus of the same serological type. Cruickshank and Godber[5] showed in two small outbreaks of puerperal sepsis that the most likely reservoir of the infecting streptococcus was the air or dust of the wards, and that secondary streptococcal infection in a diphtheria ward was most probably dust-borne. On the assumption that infected dust is an important vehicle for the spread of respiratory infection, and perhaps also for hospital infection of open wounds, van den Ende and his co-workers[6] have devised methods for controlling the dissemination of dust in wards by oiling of floors and bed-linen, which prevents the dust being raised into the air during sweeping and bed-making. Treatment of floors with a strong antiseptic solution has been recommended by Crosbie and Wright[7] for the same purpose, and in our present issue Garrod brings forward evidence that daylight may be of material value in reducing the risk of dust-borne infection.

The bactericidal action of the ultra-violet rays from sunlight or from special lamps is well known, and has lately been used in American hospitals and schools to control the spread of respiratory infections, and in surgical theatres to prevent skin sepsis after prolonged operations. Direct daylight, apart from sunlight, is also known to be bactericidal, but daylight diffusing through ordinary glass has usually been regarded as inert because of the removal of the ultra-violet rays. Some of the ultra-violet light does in fact penetrate ordinary glass, and American work has shown that this diffused daylight is bactericidal. Ultra-violet light, though powerfully bactericidal against moist bacteria, is much less active against dried bacteria, and is largely inactivated by the presence of gross particles of dust. In spite of this Garrod has found that the dust in first-floor wards which were receiving a fair amount of daylight yielded a much lower proportion of streptococcus-positive samples than the dust of ground-floor wards whose windows were bricked up. Similarly, 42 samples of dust on black-out screens adjacent to the windows failed to yield any haemolytic streptococci, whereas 56% of the floor-dust samples were positive. This is only circumstantial evidence of the bactericidal activity of daylight through glass, and no doubt other factors were operative—for example, ventilation and variations in the source, composition, and degree of pollution of the dust. More direct proof of the bactericidal activity of daylight was afforded when films of naturally dried streptococcal pus placed in glass-covered Petri dishes and exposed to daylight through glass were sterilized in 6 to 19 days, a south light being rather more active than a north light. Control films in a dark cupboard yielded viable streptococci up to 110 days.

These tests and experiments give some support to a widespread belief that black-out and ward-protective restrictions in hospitals have a deleterious effect on patients and contribute to the risks of cross-infection. Besides the beneficial effect of daylight, proper ventilation is a great enemy of respiratory cross-infection, and both of these are too often sadly lacking in hospital wards at the present time. Cross-infection ceases to be a bogy in the summer months, and it has usually been assumed that better ventilation is responsible; but the part which daylight itself may play needs to be further assessed. Even if the bactericidal rays are not particularly active against dried bacteria they may, by attacking sprayed droplets in their still moist form, help considerably in preventing the accumulation of grossly infected dust. Daylight in the country and small towns is likely to be more bactericidal than that in our large cities, where most of the ultra-violet light is filtered off: this may be another argument for the transfer of hospitals into the country. The note by Shooter and Wentworth, printed at page 247 this week, on the fly as a carrier of haemolytic streptococci suggests yet another vehicle for the spread of this ubiquitous organism. Their finding may have special significance for surgical units with warmer weather and the "second front" ahead. It also emphasizes the lack of fly-proof screening in most of our hospitals.

1 *Z. Hyg. InfektKr.*, 1902, **39**, 123.
2 Ibid., 1897, **25**, 179.
3 *J. Bact.*, 1941, **42**, 615, 631.
4 *Lancet*, 1936, **1**, 941.
5 Ibid., 1939, **1**, 741.
6 Ibid., 1940, **2**, 133; 1941, **2**, 755.
7 Ibid., 1941, **1**, 656.

MONTE CASSINO—CRADLE OF WESTERN MEDICINE

Salerno is one of the very few places in the Roman Empire where lingered traces of the arts and sciences of antiquity. We commemorated it as the seat of the first medical school in our issue of Sept. 25 last, when it was occupied by the Allies. They have now reached Cassino, seventy miles from Salerno as the crow flies. The vast monastery on the mountain that overlooks the town has been a centre of learning from its very foundation. In the history of medicine it has a special place, for here the medical Dark Ages showed a spark of the new spirit. If Salerno connects the Dark Ages with the remote classical past, Monte Cassino represents the dawn of modern times.

The monastery is a huge mass of buildings which occupy the top of a conical hill. It contains a large cathedral church and a series of beautiful cloistered courts of various dates. The whole complex of buildings is connected to the little town of Cassino by a funicular railway crossing a gorge which takes the whole of a tiring day to traverse on foot. Of old it must have taken the best part of a week to reach the monastery from Salerno. The monastery was founded in 529 by St. Benedict of Nursia, who died there about 544. The monks still show his tomb and that of his sister St. Scolastica, together with an ancient wall and tower of comparable antiquity. Monte Cassino has had a varied and stormy history. In 580 it was sacked by the Lombards and was rebuilt in 720. It was nearly destroyed again by the Saracens in 884, and was again rebuilt about 950. It reached the height of its influence under its great abbot Desiderius, who became Pope Victor III in 1087. We need not pursue further the distinguished and eventful history of the great foundation. It is convenient, however, to recall that the Norman Conquest of South Italy and Sicily, which deeply affected Monte Cassino, was almost exactly contemporary with the Norman Conquest of England and took place during the abbotship of Desiderius. Monte Cassino is the acknowledged first centre of Western monasticism. The Benedictine Order has always been associated with the promotion of learning. In no part of its history did the reputation of the great house stand higher than at the time that we are considering.

In the eleventh century, the greatest period of Monte Cassino, the relations between the civilizations of East and West were the very reverse of those we now know. In our time we have seen Orientals accord to our civilization the sincerest form of flattery. Things were very different then. The West knew well that not only military might but also science and learning lay with Islam. Oriental efficiency in arms, in administration, in commerce, as well as in the sciences and arts, had been more than sufficiently proved. The impression that they made on their Western contemporaries is still enshrined in our language in such Semitic words as arsenal, admiral, tariff, algebra, almanac, theodolite, damask, and a hundred others. Not a few of these Semitic terms are medical. Among them, despite their Greek appearance, the medical reader may be surprised to learn, are a number of anatomical terms such as the names of the basilic, cephalic, and saphenous veins, and, of course, the names of many drugs. The first to convey to the West the substance of knowledge on which Arabic influence was based was one Constantine. He was born about 1020, perhaps of Jewish parents. According to the common legend, he first saw the light at Carthage, but it is more probable that he was a native of Sicily. He acquired his medical knowledge in Jewish circles at Kairouan in Tunisia. This town, one of the last in Africa to be taken by the Allies, is one of the least modernized of Oriental cities. Constantine returned about 1072 to Sicily, then passing into Norman possession. There he came in contact with Robert Guiscard. In 1076 Salerno fell to the Normans and became the capital of a Norman principality under Robert. Constantine seems to have arrived at Salerno in his suite and to have acted as his secretary for Oriental languages. Having become a Christian, he retired about 1080 as a monk to Monte Cassino. There he spent his last years, translating Arabic medical works into Latin. He died in 1087. In the eleventh century the works of the ancient Greek physicians had long been lost in the West. Arabic translations of these existed, as did many works in Arabic based primarily upon them. The knowledge of these was, however, confined to those who could read that language; in other words, so far as the West was concerned, exclusively to Jews. The Arabic superstructure on Greek medicine had profoundly affected the whole outlook of the world of Islam. The advent of Latin translations of these Arabic works caused a similar stirring of the spirit in the West. Thus the writings of Constantine, being the very first of their kind, are of peculiar interest. They consist entirely of translations of Arabic-speaking physicians. Among them were several works of the centenarian, Isaac the Jew (855–955), the great physician of Kairouan. They include his work on fevers, the best of its kind for many centuries, another on diet, and a third on urines, as well as certain of his philosophical writings. There were also works of Isaac's pupil, another Jew of Kairouan, ibn al-Djezzar (924–1004), including his *Viaticum peregrinantis*, a very popular guide to travellers on the care of health. Very important was a version of an extensive work by the Persian Magian, Ali ibn Abbas (died 994), which, oddly enough, was also circulated in the name of Isaac. These works and others of the like kind provided a vocabulary of technical terms, the remains of which can still be traced in our medical nomenclature.

Despite the vicissitudes of the great monastery where Constantine rendered this first service to medicine there still remain in the library some fourteen hundred manuscripts of great antiquity. A considerable number of these are medical and of the time of Constantine himself. Some are of yet earlier centuries. There is also evidence, into which we cannot now enter, that some of Anglo-Saxon medical texts that are of the time of the Norman Conquest were prepared at Monte Cassino. On this account, as well as for their value as monuments of civilization, we rejoice to learn that these most precious documents were long ago removed to a place of safety.

OESTROGENS AND THE OVARY

Fundamental discoveries in endocrinology were made at a time—about fifty years ago—when only crude glandular extracts were available for endocrine research. But many conclusions were reached on the basis of what seemed fitting rather than on actual observations. Such were Brown-Séquard's claims for the rejuvenating action of testicular extracts, and under the same heading must be placed scattered references to a stimulating action of ovarian extracts on the ovaries. With the discovery of the chemical nature of the ovarian hormones and the isolation of pure chemical products these claims were not substantiated. Recent evidence, however, suggests that oestrogens do in fact stimulate the ovary. An interesting series of papers on this question was published in 1942 by Bullough, who belongs to the school which believes that oogenesis proceeds in the ovary throughout life. Whether this is true or not does not detract from the value of his observations. Bullough first studied[1] the number and position of the mitoses in the germinal epithelium of the mouse ovary at the different stages of the oestrous cycle, using the colchicine technique to ensure that enough mitoses were available for comparative counts to be made. Colchicine causes the arrest of all mitotic divisions in the metaphase, which is easily seen microscopically. Thus in an animal killed 9 hours after an injection of colchicine all the mitoses that have occurred in this period will be incomplete and all may be counted. The average total number of mitoses in the germinal epithelium of each ovary he found to be 20 to 31 during the three days of dioestrus, rising to 81 during pro-oestrus, followed by an enormous increase during oestrus, a total of 1,210 mitoses being recorded as a post-ovulation peak, with a rapid fall to 100 mitoses during metoestrus. He then studied the distribution of the mitoses, and though there was some variation in their number in all positions the greater part of the increase found during post-ovulation oestrus was in those areas of the germinal epithelium adjacent to the developing corpora lutea (actually 997 of the total 1,210 were situated there). Bullough suggests that the increase in the number of the mitoses in this place is due to its being bathed in the oestrogen-rich follicular fluid extruded in ovulation. In support of this view was the fact that mice with fewer follicles than normal, or in which a smaller number of follicles ovulated, had fewer mitoses. Bullough then proceeded[2] to see whether this idea of the action of oestrogen on the mitoses of the ovarian cells could be supported elsewhere. To do this he divided the membrana granulosa and theca of the developing follicles into zones and counted the number of mitoses in each after an injection of colchicine. He found that the number of mitoses is greatest in those follicle cells nearest the oocyte and the antrum, and diminishes progressively towards the periphery of the follicle. In the developing corpus luteum mitoses are at first most frequent in the old granulosa cells nearest the extruded follicular fluid, but later they become common in the cells adjacent to the newly formed reservoir of tertiary follicular fluid. Lastly, he proved[3] that the effects attributed to the follicular fluid are due to the oestrogen it contains. Large doses of oestrone (25 μg. at twelve-hourly intervals in 1 to 5 injections) were injected intraperitoneally into dioestrous mice as near to the ovaries as possible. The mice were killed 12 hours after the last injection and 9 hours after an injection of colchicine. In all cases there was a stimulation of the mitoses in the germinal epithelium, a total of 1,818 being counted in one ovary after 5 injections. The injections also reduced the normal rapid growth of the follicles, particularly of the larger ones.

Bullough concludes that oestrogen directly stimulates the ovarian cells. Theoretically the objection may be raised that since the mice had intact hypophyses a possible action on gonadotrophin secretion cannot be ruled out, though this does not seem likely in view of the time relations involved. Bullough himself regards the fact that the injections have to be given in the neighbourhood of the ovary as strong evidence of direct action, though many substances are absorbed more rapidly from intraperitoneal injections than from subcutaneous ones. However, these arguments are not really essential, since it has been shown by Williams[4] and by Pencharz[5] that the atrophy of the ovary which normally follows hypophysectomy can be prevented by the implantation of stilboestrol tablets, clearly showing that oestrogens can influence the ovary in the absence of the pituitary gland. The dose necessary to produce these effects is large, though Bullough's observations during the normal oestrous cycle suggest that the action is physiological. The full theoretical implications of the findings and their possible clinical applications remain to be studied.

1 *J. Endocrinol.*, 1942, **3**, 141.
2 Ibid., p. 150.
3 Ibid., p. 235.

"BRITISH MEDICAL BULLETIN"

The first number of the second volume of this bulletin—on penicillin—starts the second year of its most successful career. The *B.M.B.* is published by the British Council and forms an important part of the activities of the Council's Medical Department, under the direction of Dr. N. Howard Jones, who is now a whole-time officer of the Council employed on this important task of informing medical men in other countries of the work that is being done by British doctors.

The B.M.A., and more especially the *Journal*, has an interest in this undertaking and can take some pride in the successful way it has been carried out, for it was in 1940 that informal conversations were held between the Medical Research Council, the Ministry of Information, and the Editorial Department about supplying trustworthy information to foreign and friendly countries in order to create a basis of fact against which the foreign reader could judge misrepresentations made by the enemy. It was finally agreed that the war was proving a stimulus to a course of action that should have been entered into long before, and it was soon decided that the diffusion of medical knowledge from this country should be embarked upon as a long-term policy, and not as a short-term attempt to counter the absurd propaganda put out by the Germans. Dr. Howard Jones was appointed in August, 1940, to carry out this work in the Editorial Department of the *Journal* under the Editor's direction, and a scheme was prepared for sending to different parts of the world abstracts of important articles in current British medical journals, translated when possible into the language of the recipient country. Original articles by leading medical men on work in which British scientists had played a large part were also written, translated, and submitted for publication to foreign medical journals. Although some of the abstracts found their way to the bottom of the ocean, many were eventually printed in the foreign medical press, and medical editors and individual medical men abroad expressed their appreciation of the fact that at last this country was doing something to keep others informed of what was happening here in medical science. At the end of a year the basis of the British Medical Information

4 *Nature*, 1940, **145**, 388.
5 *Science*, 1940, **91**, 554.

Service, as it was then called, was firmly established, and at this point the British Council, which had been supporting the work from its beginning, suggested that they should now take it over completely as a permanent part of their activities, and in October, 1941, Dr. Howard Jones and his small staff left B.M.A. House for Hanover Street. The Council has recently begun to produce medical films, one of which, "Surgery in Chest Disease," is now familiar to many.

The *British Medical Bulletin*, the latest issue of which has suggested to us that we should put on permanent record the short history of the British Medical Information Service, developed out of the abstracting service and is fast becoming a real contribution to medical literature. It is published in English, Turkish, Portuguese, and Spanish. Recently the tendency has been to make each number a symposium, and the present one on penicillin provides a document which is almost indispensable to anyone who is working on this subject and who really wants to know the literature on it up to date. The symposium begins with six articles on various aspects of penicillin by Prof. L. P. Garrod, Prof. A. Fleming, Dr. E. Chain, Prof. H. W. Florey, and Dr. M. E. Florey. Then comes a review of selected papers in order of publication, beginning with 1929 and ending with 1943. A short appendix follows. The care and thoroughness with which this excellent symposium has been put together are a great credit to the compiler.

EUGENIC AND GENETIC ASPECTS OF THE Rh FACTOR

Many recent papers have added to our knowledge of the Rh factor and its responsibility for the great majority of cases of erythroblastosis foetalis. Haldane[1] has made an interesting contribution to this discussion, for he shows that important questions arise in the field of population genetics and of practical eugenics. Nine out of ten cases of erythroblastosis foetalis are due to the development in the blood of an Rh-negative mother carrying an Rh-positive foetus of immune bodies capable of agglutinating Rh-positive red cells. About 10% of all pregnancies among white American or British mothers are of this type, so that an additional factor, probably placental permeability, must also be involved. Haldane adopts the conservative estimate of a death rate from the condition of 1 in 200 conceptions, so that the abnormal permeability occurs in about 5% of cases. Using the above figures, he shows that the existing 14% or so of Rh-negative persons would be reduced to 1% in little more than 600 generations, or 15,000 years. This is a short time in the history of the human species, so that the existing population must be in a state of highly unstable equilibrium. Haldane discusses three hypotheses which could account for this strange state of affairs. The first is that recent environmental changes have led to a sharp increase in placental permeability: all the available evidence is against this possibility. The second is that the heterozygous state—that is, the possession of one Rh-positive gene and one Rh-negative gene—confers some counterbalancing advantage. This hypothesis is equally unlikely, for it would demand a favourable effect many times greater than the highest possible limit for the ordinary blood-group genes. The third hypothesis remains—that the present unstable proportions are due to recent racial mixture. Any human community would, left to itself, fairly rapidly become almost uniformly Rh-positive or, alternatively, Rh-negative, save for rare exceptions due to mutation. It is possible, therefore, that the European races have arisen in the not very distant past from the crossing of Rh-positive and Rh-negative races, and are now undergoing a process of swift change. The study of Rh frequencies in different populations is thus likely to prove of high interest anthropologically. Haldane notes that it has already been discovered that only one out of a series of 120 North American Indians was Rh-negative. He points out more generally that variation in placental permeability and intense selection against heterozygotes may have been one of the mechanisms by which mammalian species have become distinct.

Haldane suggests that erythroblastosis foetalis provides a concrete test case for the advocate of negative eugenics—a case, moreover, which cannot be ignored, for this disease is certainly responsible for more deaths than are due to any other inherited condition. It is obviously futile to suggest that the 14% of Rh-negative women should not marry Rh-positive men—that is, that 86% of the male population should be barred to them. Nor could it be seriously suggested that the Rh-negative character ought to be eliminated by sterilization. If it should be found, however, that the abnormal placental permeability also depended upon a gene, he considers that there would be a strong case for dissuading women with the doubly unfavourable constitution (less than 1% of all women) from marrying Rh-positive men, and an arguable case for compulsion. But if the eugenic problem cannot be ignored it can, as Haldane goes on to show, be evaded. He suggests that the testing of pregnant women for the Rh factor, and if found negative, then further testing for the anti-Rh agglutinin, would give timely warning of the risk of erythroblastosis foetalis and facilitate prompt treatment by transfusion with appropriate blood. Actually this is no longer speculative. Since his paper was written Gimson[2] has described in this *Journal* a highly successful series of cases, and is able to conclude that, if an infant suffering from the condition lives long enough to reach hospital, there is a good chance of survival. In fact, up to now this is the finest example of an application of genetic research leading to the chance of timely recognition of a great danger and thus to prompt and successful treatment.

STANDARDIZATION OF NON-IONIZING RADIATIONS

The Medical Research Council has appointed the following as a committee to advise and assist it in promoting the quantitative study of the non-ionizing radiations, particularly in relation to their medical applications: Prof. H. Hartridge, M.D., F.R.S. (chairman); F. Bauwens, M.R.C.S.; R. B. Bourdillon, D.M.; E. Rock Carling, F.R.C.S.; Prof. J. A. Carroll, Ph.D.; J. Guild, F.Inst.P. (nominated by the Department of Scientific and Industrial Research); Prof. F. L. Hopwood, D.Sc.; and Prof. W. V. Mayneord, D.Sc. (secretary). In 1928 and 1937 satisfactory units for the measurement of ionizing radiations were agreed internationally, and there is urgent need of a corresponding standardization for the non-ionizing radiations. Under this heading will be included infra-red, visible, and short-wave wireless radiations, but it may be found advisable to deal also with ultra-violet and ultrasonic radiations, since none of these was covered by the earlier recommendations.

We regret to announce the death of Mrs. Frances Ivens-Knowles, M.S., F.R.C.O.G., late clinical lecturer in midwifery and gynaecology in the University of Liverpool, and during the last war surgeon-in-charge of the Scottish Women's Hospitals at Royaumont and Villers Cotterets.

[1] *Ann. ugenics*, 1942, 1 333.

[2] *British Medical Journal*, 1943, 2, 293.

Nova et Vetera

FIRST AID 140 YEARS AGO

Though the term "first aid" was not invented in his time, yet Dr. William Buchan's *Domestic Medicine, A Dispensatory for the Use of Private Practitioners*, published in 1804, was really an early attempt to give the general public some systematized advice on how to deal with accidents and illnesses before the arrival of the doctor, though in some respects the book goes far beyond this. For his "private practitioner" was the layman pure and simple. It may be of interest to see what the person whom we should now call the first-aider was expected by our author to do.

Some Drastic Measures

For one thing, he was expected to apply some heroic measures which will make the hair of the modern reader stand on end. An instance of this is the method recommended for the reduction of what Dr. Buchan calls "Dislocation of the Neck." He advises that the "unhappy person" should be laid on his back while the good Samaritan takes hold of his head with both hands, braces his knees against the patient's shoulders, and pulls the head "with considerable force" while "gently twisting it at the same time," if the face be turned to one side, until he perceives the joint to be replaced, which the operator will know "by the noise the bones make when going in." After this, the patient is to be bled and suffered to rest. We shall probably agree that the phrase "unhappy person" is not a whit too strong. On dislocation of the jaw he is sounder, giving a method very similar to our own. But he also mentions a drastic method used by the "peasants" which, he tells us, he has often known to succeed, though he does say the plan is "dangerous." It is. For the "peasant" puts a handkerchief under the patient's chin, then turns his back on the dislocatee and pulls him up by the chin so as to suspend him from the ground.

Much of his advice on how to deal with "Substances stopt between the Mouth and Stomach" is quite common sense, though we can hardly approve of his plan, "if fingers and nippers fail," of "bending a piece of pretty strong iron wire at one end," introducing it on the flat below the obstruction, and pulling it up. He advises, cautious man, that a piece of string be attached to this instrument in case of "ill accidents" such as slipping from the operator's hand. His method of artificial respiration, however, is quite passable if we remember that he wrote before the advent of Silvester, Schäfer, and Eve. Dr. Eve, indeed, would quite approve of his insistence upon the necessity for restoring "the natural warmth" as a "principal intention." He himself favours immersion in a warm bath after or during the application of mechanical measures such as blowing by a "strong person" into the patient's mouth with the nostrils stopped, and pressing the "breast and belly" so assist expiration. But other measures he mentions to restore the natural warmth are somewhat drastic. One he quotes with approval is to lay the body on hot ashes, cover with ashes equally hot, put a bonnet on the head, and wrap a stocking filled with hot ashes round the neck. He does not altogether disapprove even of the method which, he says, is used in some parts of the countryside—viz., to make use of the warmth of a dunghill.

Immediate Treatment of Wounds

Dr. Buchan's general directions for the immediate treatment of wounds are very sensible considering that he wrote before asepsis and antisepsis had been thought of. He ridicules the implicit faith placed in "certain herbs, ointments, and plasters as possessed of wonderful healing powers," insists that Nature does the cure, and explains that external applications assist only by keeping the parts "clean, soft, and defending them from the external air." For this purpose he recommends clean, dry lint as a first dressing. He is not so sound, however, in resorting at once to the tourniquet when there is haemorrhage, nor does he give proper warning as to the dangers incurred by improper use. He, of course, knows nothing of "pressure points"; indeed, he does not even so much as mention any form of digital pressure.

His advice on the treatment of fractures is more applicable to the professed surgeon of his day than to the "private practitioner." He does, however, give a much-needed caution as to the danger of tight bandages. On the general application of bandages to various parts of the body, however, he gives no directions, being of the opinion that any person of good parts will be able by native genius to apply them correctly!

Space has only allowed me to pick out some of the high spots in this curious treatise. In justice to the author, it must be owned that he is, on the whole, not unsound according to his lights. It is therefore all the more surprising when we come upon passages like some cited above and like the one in which he gives his sanction to the employment of fresh cow-dung poultices in the immediate treatment of bruises.

E. W. A.

Correspondence

Publication of Anaesthetic Misadventures

SIR,—May I seek the courtesy of your columns to make an urgent request to all anaesthetists to publish a record of deaths and untoward incidents occurring under any form of anaesthesia and analgesia. Two deaths under local analgesia have been briefly recorded during the last five weeks in the *Evening Standard*, and it is a matter for regret that these deaths were not fully reported in the medical journals, as local analgesia has been generally regarded as very safe.

Anaesthetic mortality and morbidity in this country is far too high, and it does not at present seem that a noticeable drift away from inhalation anaesthesia and the adoption of other methods are leading to improved results; rather the reverse. Newly qualified practitioners often appear to have a very imperfect understanding of the relative safety of various anaesthetic techniques, and this unhappy ignorance may be the cause of avoidable deaths.

Under an entirely erroneous impression that ether leads to chest complications some anaesthetists are adopting the use of new and somewhat dangerous drugs, the physiology of which is as yet imperfectly understood. A false sense of security will arise and "modern anaesthesia" will become (if it has not already done so) far more dangerous than chloroform anaesthesia at its worst, unless practitioners are prepared to publish the complete records of all misadventures experienced during the experimental stage. Let it be remembered that many modern anaesthetic methods have not yet passed the experimental stage and we need much more information. The Association of Anaesthetists could materially assist by organizing a large-scale investigation as to the relative danger or safety of all anaesthetic drugs and the manner of using them.

There is at present a strong tendency to gamble safety for comfort, and this tendency is strengthened by ignorance caused by a very natural reluctance to publish our misadventures and a readiness to publish records of a series of our cases successfully anaesthetized by some new technique; thus a too optimistic picture of the real position is given. The investigation into analgesia in labour published by the Royal College of Obstetricians and Gynaecologists in 1936 showed how misleading individual experiences can be, and that a series of two or three thousand cases really shows us very little. Flagg, too, in his *Art of Anaesthesia*, stresses how inadequate is the experience of any one individual, however great that may be, to form a basis for a true statistical estimate for the guidance of others. We must take a wide view, and we can only come to a right judgment by co-operation and complete frankness. The American journals set us a very good example in this respect. Nothing can be gained by silence, and the general public, too, might then begin to understand their foolishness in not paying more attention to the importance of the art and science of anaesthesia. It is utterly lamentable that a surgeon should tell us in 1944 that in a county hospital "the anaesthetics are given by house-surgeons, many of whom have no previous experience" (O'Connor, *British Medical Journal*, Feb. 5, p. 199).—I am, etc.,

New Barnet. JOHN ELAM.

Chloroform Anaesthesia

SIR,—Recent letters in the *Journal* on the teaching of anaesthetics have drawn attention to the need for some improvement. I should like to see a crusade against the use of chloroform. Most authorities concede that the use of chloroform might possibly be justified in certain circumstances in the hands of an expert. Instead of this we find that the expert has abandoned chloroform altogether, and the only people using it, or mixtures containing it, are the inexpert, such as the resident, giving anaesthetics in the absence of the resident anaesthetist, or the overworked G.P. If there were better teaching of anaesthetics these people would understand the risks they run in using such a dangerous and toxic drug.

Almost at once after the induction of chloroform anaesthesia there is a fall in blood pressure. This fall is caused by heart failure

alone, and the heart may even fail before respiration. (This never happens with any other anaesthetic agent.) Levi was one of the first men to draw attention to the dangers of ventricular fibrillation under *light* chloroform anaesthesia, and to point out that the *deeper* the degree of anaesthesia the greater the chances of recovery. Blalock in 1928 recorded that the cardiac output in a series of eight dogs under ether increased an average of 20%, whereas with chloroform the cardiac output was decreased an average of 30%. Two hours of chloroform anaesthesia have been proved to be followed by liver changes which take 6 weeks to return to normal. Those who ridicule the dangers of chloroform do so chiefly from ignorance of these proved physiological facts.

Chloroform certainly has no place in the hospital; it may possibly be of use where no other anaesthetic is available—for example, in a ship at sea. Boyle's apparatus with chloroform and ether in series is potentially a danger. The chloroform bottle might now be discarded, and even were it needed, why is it not placed after the ether instead of before it? Were this so, at least we should only get chloroform polluted by ether, and not be found giving fifty-fifty chloroform–ether with only the ether tap turned on. Where there is risk of explosion there are now many agents we may use without having to resort to chloroform, such as intravenous pentothal or evipan, perhaps supported with gas-and-oxygen; gas-and-oxygen alone or supported by trilene; in thoracic surgery, unilateral spinal; and for, say, exploratory laparotomy light percaine spinal.

It will probably be a considerable time before all anaesthetics are administered by experts, but at least we should demand that all who are called upon to give them should have a reasonable knowledge of their dangers.—I am, etc.,

H. PARRY PRICE.

Blood-pressure Readings in General Surgery

SIR,—May I reply to those who commented on the article on this subject (Dec. 25, p. 811).

To Mr. J. Hosford (Jan. 8, p. 59) I would say that blood-pressure readings can be done in all hospitals and should be taken in teaching hospitals where student help is available. Surgeons who have enjoyed the assistance and the instruction that these regular pressure records give must articulate their value so clearly and convincingly that they ultimately become as routine at operations as counting swabs.

With regard to deaths on the table, may I repeat that when blood pressures are taken during operation patients never reach the stage of death, actual or impending, without the entire surgical team being warned for some time previous, and their united efforts are directed to resuscitation. When such a crisis occurs, the instruction of the readings assists in the selection of the remedy and its correct dosage, for too little or too much may be given. Our pressure observations enable us to say that certain drugs given in a certain way will in a certain time act in a certain amount for a certain period; these include ephedrine, pholedrine, methedrine, cardiazol, coramine, and paradrine among others. So valuable are blood-pressure readings that a recorder of them at major operations is arranged for in the same way as the anaesthetist.

I assure Drs. Fearnley, Langton Hewer, and Morgan Jones (Jan. 15) that besides the blood pressure the other factors they mention are considered, but the short article omitted to state this; it attempted to evaluate the blood pressure for surgeons.

I am aware of the danger of a failing left heart; for instance, I find it difficult to diagnose clinically between it and an early carcinoma of the stomach. Likewise I have seen a patient recovering from a coronary infarct with a blood pressure of 130/90 superficially by the cardiac index alone a good surgical risk, yet the output of that heart was irregularly irregular (negativing operation) and the history told of a prethrombotic pressure of 220.

The variation in blood pressure from observer to observer and from time to time was noted in the article, but the cardiac index as a rule is approximately constant, and the improvement from rest in bed and other remedies, estimated by my house-surgeons, blood-pressure reader, and myself, has been confirmed. The stimulants are given by the mouth—usually coramine, cardiazol, or strychnine (a general rather than a cardiac tonic)—and for the irregularly irregular rhythms digitalis, although auricular fibrillation is comparatively rare in surgical practice.

Patients needing operation are not denied them because of the cardiac index, but they may be prepared for several weeks until they are deemed fit enough, and salutary experience confirms its necessity. Catastrophes in the cardiovascular system occur often enough to require its critical evaluation, and I repeat that the blood pressure intelligently taken will reveal significant information and with the cardiac index will be found a guide in the general run of operation patients.

With regard to the high pre-operative intake of fluid, experience shows that patients need it before a major operation. I know that in the treatment of heart disease fluids are limited deliberately, but when the cardiac lesion is as gross as this, preparation for operation is the physician's responsibility, and operation at this time is usually out of the question.

I like Dr. Langton Hewer's expression of the anaesthetist's problem, "not 'Can this patient survive my anaesthetic?' but 'Can I improve his general condition sufficiently to enable him to withstand the surgical trauma, and to live long enough to benefit by the effects of the operation?'" It is a charter for the physician-anaesthetist and the surgeon too!—I am, etc.,

London, W.1. HAROLD DODD.

Obstetric "Shock"

SIR,—The condition of obstetric shock requires the clearest definition, and I should like to elaborate Dr. Alders's admirable letter (Feb. 5, p. 197). The shock following obstetric mishandling is clearly surgical shock and has no place in this discussion. Its incidence should diminish when the three great causes of obstetric intervention—expediency, fear, and clamorous relatives—are given their correct place in our judgment.

The second, more nearly related, shock is that caused by pituitrin. The incidence of this too will, I hope, decrease when pituitrin is no longer given as a routine, a procedure which can be justified neither by reason nor by necessity. The shock it produces is sometimes thought to be a protein reaction, but I believe the mechanism to be the same as that causing true obstetric shock—the sudden release of a shock-producing substance (histamine, if you will) from the damaged muscle fibres in the uterus. These fibres have already shortened to the minimum physiological length, a process unique in duration and degree. Moreover, they are required to "hold" this shortening. The resulting relative anaemia does not allow the waste products of this immense effort to escape; the subsequent relaxation of the uterus is, I believe, concerned solely to allow these products free exit. It is therefore the worst possible obstetric practice to over-exert these gasping fibres with pituitrin, or to damage them with the manual clumsiness of Credé's expression, a procedure again too often dictated by expediency or fear. Although true obstetric shock is so seldom seen, the tolerance of the uterus is no excuse for insulting it.

Blood transfusion, though empiric in reason, is admirable in treatment. When, however, we replace in our minds the fear of the third stage of labour, from which all of us have suffered or do suffer, with the quietness and confidence of uterine understanding, the necessity for such treatment will be minimized.—I am, etc.,

London, W.1. MORTIMER REDDINGTON.

Rehabilitation: A Warning

SIR,—This letter is not designed to be destructive. For three years now I have had the opportunity of following up, in most cases by weekly interview, those injured at the factories of a group of 8,000 workers. In many of these cases I have seen the place at which the injury occurred and know how the accident happened. In some cases I know, or at any rate try to find out, why it happened. In all cases I have tried to get some idea of the make-up of the injured workman and how he lives.

It is clearly right on moral grounds that every injured workman should receive the most skilful treatment and be returned to work with as little disability as possible. To this end it is clear that the support of industry and companies carrying the risks of workmen's compensation should be given to hospitals which aim at providing the highest standard of surgical care. From observations made on 1,000 workers admitted to compensation I would plead that it is necessary to move slowly in estimating the value of rehabilitation. Is not the word becoming almost mystical? One cannot but be amazed

at the initiative of many injured in overcoming any disability, even when the architecture of first treatment has been faulty. Has the surgeon made sufficient study of those who have adapted themselves to their disabilities? It is doubtful.

The first essential is first-class first treatment. The number of those who will benefit by an elaborate machinery of rehabilitation is not as large as some think. True, for patients with major injuries and those with a necessarily long absence from work rehabilitation is absolutely essential. It is the care of this type of case which has attracted public attention, and rightly so. Rehabilitation without the insurance of a planned return to work is a mockery and can do grievous psychological trauma. But among patients suffering from less major injuries I believe there are a number who will show through rehabilitation an unnecessary delay in returning to work. They are those who, with the utmost care of the staff of the rehabilitation centre, will surely become over-interested in themselves and tend to fix their minds on the injured part. Many patients are harmed by the unguarded advice of those who treat them. Malingering in the series of cases I have seen is almost non-existent. If, as I contend, there is a delay through rehabilitation of the return to work of those with less major injuries, then it is a serious matter. Full function must be our aim whatever the cost, but the cost must be reasonable. A man's own initiative is still the best second to first-class surgical care. The extra weeks on all these non-major injuries would mount the cost beyond a reasonable figure, and if the State takes over the workmen's accident insurance it must operate without extravagance.

This letter is but a warning that rehabilitation may so easily be overdone, and such a useful advance lead to some abuse. Cannot much rehabilitation be done in the factory, much of it on the workers' original work?—I am, etc.,

W. JEAFFRESON LLOYD.
Guest, Keen and Nettlefolds Ltd., Birmingham. Works Medical Officer.

Doctor and Patient

SIR,—I am astounded that in your annotation on doctor and patient (Feb. 5, p. 189) you should see fit to state: "It is very wrong, therefore, for a private practitioner to attribute banal symptoms to industrial processes of which he knows nothing, to give long holidays for trivial maladies, or to declare a worker unfit for a particular job on eleemosynary rather than scientific grounds." These are so obviously the words of a writer who is quite ignorant of the medical situation in an industrial area that they call for correction. Quite apart from the specific lesion—such as industrial dermatitis or silicosis—which is caused by industry, the whole industrial set-up imposes upon the individual a discipline and a compulsion which, in the case of the rebel and the emotionally unstable, often become unbearable. It is precisely when health is lowered that this strain is most acutely felt by the patient.

It is all very well to talk about science, but there is no science without public standards, and there are no public standards for this situation. Psychology is still looking for them. Eleemosynary is a word meaning charitable, commonly used by the uncharitable. The argument therefore is that the worker in the hour of his complaining requires science but not charity. Is this really editorial opinion? Surely what these patients need from their doctor is just plainly charity, and it is to the credit of general practitioners that they commonly get it.

If the industrial set-up did its job with more success, if it gave us a stable economy, if it contributed to the integrity and well-being of the family, if it made our cities beautiful and the insight of the common man more profound, then perhaps the doctor would be justified in inviting his patient's co-operation in these good and charitable works. But unhappily industry does none of these things, and its insight into the nature of human need is superficial in the extreme. Its development of human skill is subject to question. And the quality of the community life that goes on in the back streets of our industrial towns is something which I for one cannot contemplate with complacency.

The common working doctor does well if he stands by the common working man in good will and charity. Science cannot yet provide him with infallible guidance in this territory. Every clinician recognizes that outside the realm of definite diagnostic labels there are many indefinite debilitated states that are little understood and subject to variegated labelling. The general practitioner knows perhaps better than the leader-writer the need for science. But his need is for a science which will give an account not only of the fragments of disease but also of the whole—of healthy persons in a healthy setting. Such a science will lay down the scientific as distinct from the moral standards of family and community life. To these it will be the duty of industry to conform. To invoke science as the only sanction for a label which will permit the worker to lay down for seven days the burden of his obligation to the Work State is by way of being rude to Science. It is to use a good thing ill.—I am, etc.,

Coventry. K. E. BARLOW.

Reform in Medical Education

SIR,—Dr. Walshe has framed a cogent indictment of the medical curriculum as it stands and of the proposals to amend it by additions. Many hearts must sink at the thought of the poor patient camel of a student kneeling to receive his eighty lectures of psychologists' psychology to top his present burden, and many must marvel at the naivety which can expect him to become thereby a more "insightful" and less materialistic practitioner.

But Dr. Walshe does not, as I think, carry his argument to its logical conclusion. He points out that the curriculum fails to teach clear and logical thinking and the right use of words; that it encourages credulity and breeds practitioners and even teachers who "fail to distinguish between thoughts, words, and things," and who are unable to speculate fruitfully on the theoretical basis of medicine; but he seems to imply that these qualities of mind could be cultivated within the framework of a curriculum, pruned and revised indeed, but still a technical medical course of teaching. Surely the really disastrous consequence of the curriculum's unwieldy bulk and weight is that it has sunk into and destroyed its own foundations. The place and time to learn the right use of words in thought, speech, and writing, to acquire the habit of speculation and the beginnings of wisdom and understanding of the human mind, is at school in the sixth form—or its equivalent—between the ages of 16 and 18.

These acquisitions are a natural and almost inevitable accompaniment and consequence of the intelligent study of a foreign language—ancient or modern—with its literature, of our own literature, or of history. They are not a natural or inevitable accompaniment of the study of elementary chemistry, physics, and biology. If we want to have in our profession clear-headed thoughtful doctors able to express themselves lucidly and concisely, with a flair for truth and a contempt for muddled thinking, we must at least allow the intending medical student to become a scholar if he has it in him. If we wish the doctor to understand men's minds we must at least allow him to read the thoughts they have expressed and to learn of their behaviour as recorded by historians, dramatists, poets, and the greater novelists. If we wish the doctor to think we must encourage and even compel the student to arrange and express his thoughts. At present it becomes harder every year for a boy who, at 16, rashly declares his intention to become a doctor not to abandon all hope of becoming also a well-educated man.

Is it not abundantly clear that to attempt reform of the curriculum by additions, however desirable in themselves, is a disastrous policy if the end in view is to produce a generation of doctors worthy of medicine and of their country? Subtractions, even by themselves, would be better. But subtractions, of course, will not serve. The only way with the curriculum, if our intentions are serious, is to "shatter it to bits and then remould it nearer to our heart's desire," and the remoulding must begin with the examinations which govern it. When at least one question in every paper begins with the word "discuss" and means what it says, and when one paper in each examination is an essay paper, carries high marks, and is judged on form as well as content, we shall be getting on.—I am, etc.,

London, N.W.3. LINDSEY W. BATTEN.

Research in Ophthalmology

SIR,—The letter on research in ophthalmology from the president of the Association of British Ophthalmologists (Jan. 29, p. 158) is one which I hope will commend itself to most ophthalmologists. I have heard no contradiction of the view frequently expressed by me and by others that research in ophthalmology, with the closely allied activity of "prevention of blindness," while being of high quality, has not in the past been attacked with a vigour comparable with its great importance. The humanitarian and financial responsibilities resulting from blindness are of a considerable magnitude.

These basic considerations have been debated in the Prevention of Blindness Committee of the National Institute for the Blind for the past five years, and the committee reached a decision that the most effective way of reducing the incidence of blindness, now that surgical technique has attained such a high standard of efficiency, would be to institute independent but co-ordinated centres of research in certain universities and Royal Colleges. Two such centres have already been established—one in the University of Oxford and another jointly by the Royal College of Surgeons and the Royal Eye Hospital, London. Provision for further extensions of this important aspect of prevention of blindness is at present under consideration. As soon as this provision is authorized the junior members of hospital clinical staffs should be informed that for selected workers research in ophthalmology will offer a congenial career, comparable with other methods of the practice of their profession. Young clinical assistants with a flair for research will no longer feel that they are entering a backwater, and that their families will be financially penalized if they pursue research work for which they are specially suitable and for which they are willing to be trained.

I do not agree with Mr. Green, however, when he details as an alternative to this policy the creation of a Faculty or College of Ophthalmology. Such an advancement in ophthalmic organization is desirable and would be complementary and supplementary to the extension of facilities for research in teaching institutions, but it could never adequately replace such facilities. Successful research in ophthalmology implies the closest association with the basic sciences and with abundant clinical material.

I feel that no useful purpose can be served by attributing the neglect of research in ophthalmology in the past to any particular persons or group of persons. Rather should we recognize the great need for organized extension of facilities and concentrate on the best methods of making provision for such extensions. That certain universities and the Royal Colleges are suitably organized for carrying out such research under the most favourable conditions will, I hope, be agreed, and must be the method of choice in any comprehensive policy for the evolution of research in ophthalmology in the future.

Provision is also being made for the individual research worker, whose bona fides is established, through a minor research fund.—I am, etc.,

C. G. KAY SHARP,
Chairman, Prevention of Blindness Committee, National Institute for the Blind.

Leeds.

Actinomycosis of Liver

SIR,—Mr. Hubert Chitty (Jan. 22, p. 115) reports the recovery of a case of actinomycosis of the liver. It would be interesting to know what treatment, if any, this patient received after his operation in Feb., 1929; whether the patient recovered as the result of the development of some immunity reaction or following the administration of iodine in some form or other.

There is an apparent contrariness in the results of treatment with iodine, whether given as iodide of potassium or tincture of iodine, some cases progressing to complete cure, others showing no improvement. This contrariness depends, so I believe, on whether there is or is not a secondary infection with pyogenic bacteria.

I have seen only five cases: the first, one of the lung with extensive cavitation and heavy secondary infection approaching the terminal stage. In the second, an abscess of the appendix with secondary abscesses, there was a secondary infection with *B. coli* not only in the primary but in all secondary abscesses, which, when aspirated, gave a heavy growth of *B. coli* and showed typical actinomycosis granules; treatment with iodine was without effect; surgical treatment and packing with bipp resulted in death from nephritis due to bismuth poisoning. Nos. 3 and 4 were abdominal cases, operated upon, and reported by the pathologist as actinomycosis; there was no secondary infection, and both cases were cured by tinct. iodi (French *Codex*). No. 5 was an empyema. The surgeon remarked on the unusual hardness of the lung. Typical actinomycotic granules were present in the evacuated pus and in the sputum, but with no evidence of any secondary infection. Treatment with iodine in the form of tinct. iodi (French *Codex*) resulted in a cure, and the patient was still well and free from lung trouble 10 years later.

These cases seem to favour the theory that actinomycosis, like tuberculosis, is a much more serious affair when secondary infection has taken place. Recent reports on the cure of actinomycosis with sulphonamides suggest that it is in these cases where secondary infection has occurred that its chief advantage is likely to be reaped, especially if combined with iodine, and personally I like to give the iodine as tinct. iodi (French *Codex*), now known as the liquor iodi simplex.—I am, etc.,

West Malvern. F. H. JACOB.

Bone-marrow Transfusion

SIR,—Since the method is not yet in general use it seems worth while to second Mr. Hamilton Bailey's favourable testimony. By the intramedullary route I have given transfusions to forty infants under 1 year old, using the marrow of the tibia because the manubrium is not a good site in such small subjects. There was no difficulty at all, nor was any trace of sepsis encountered, though it was sedulously looked for in every case. The technique is utterly simple and the discomfort momentary. Any collapsed and dehydrated infant can have a transfusion under way within ten minutes of admission to the ward. Of course the clinical value of marrow transfusion is no greater than that of intravenous therapy by any other route; its virtue is purely technical. Still no one who has fumbled with a Bateman's cannula and a vein like a bit of chewed cotton, no one who has seen the last available venous channel firmly clotted up, no one hard pressed for time, once having tried this new method is likely to revert to the old. The only snag (barring over-enthusiasm engendered by facility) is the difficulty at the present time of getting needles sharpened.

One more point: some time ago in your "Any Questions?" column I saw mention of a serum needle for marrow transfusions. This is to be deprecated. Tocantins's needle, well and stoutly fashioned for its special purpose, is the weapon of choice.—I am, etc.,

The Grove Hospital, S.W.17. J. B. ELLISON.

Babies in a Glass Cage

SIR,—Some publicity recently has been given in a number of lay periodicals to the design and equipment of the new Children's Hospital, Birmingham. The public are told journalistically, of our backwardness in baby welfare in this country, but that at least one step has been taken at Birmingham to put this right. Here "the idea behind is isolation." Ill babies are placed in glass cubicles isolated from friend and foe. They are suckled, if necessary, by a mother whose face has been obliterated by a mask and from a nipple whose attendant beloved breast is shrouded in a harsh, unlovely, but sterile gown. Bathing is conducted by a similar fantastic creature, but without even the beloved voice of mother to give a shred of comfort to the lost, ill, and bereft infant. After bathing (and feeding) the patient is placed in its cubicle of isolation behind whose refracting glass walls human figures appear and disappear with fantastic inconsequence, and through which the homely human sounds penetrate dully, a dim reminder as from a distance—a distance into which all the lovely, comforting, satisfying, and familiar things seem to have receded.

From this brave new world of deprivation, insecurity, soundlessness, and terrifying sights the infant victim is expected to draw fresh reserves with which to combat the invading micro-organism. How can it? Can the frustration of practically

every strong emotional need possibly cure an infant of anything? Do we, the medical profession, advocate a treatment which, I earnestly suggest, must be, for the patient, so much worse than the disease? Even if it is not, as it may be, lethal, what of the immediate misery and the ultimate consequences to mental health? Already we have with us the "evacuation problem," product of these same experiences of sudden deprivation, insecurity, and fear in older children. How much worse will be the effect on the still more sensitive 0-1-year-olds!

The general case for the control of sepsis in hospital practice —mainly surgical—is of course unanswerable, but that asepsis should be given an overwhelming emphasis in the treatment of infants is more than doubtful. With Bakwin's paper—reported in an annotation in the *Journal* of Sept. 19, 1942—offering unquestionable statistical evidence to the contrary, whatever case there was falls to the ground. Certainly submitting our frailest patients to such a fantastically severe regime should not be accepted without question as a self-evident triumph of science. It represents a failure on our part to find anything better than a barely humane and questionable remedy. To me at least, trying to see things from the patient's point of view, this latest "advance" of medical science appears as a disguised therapeutic retrogression of a most disturbing kind. —I am, etc.,

London, N.W.8. H. C. SCOTT.

Babies in Hospital

SIR,—I am in complete agreement with Dr. Margaret Dunstan (Jan. 2, p. 131) in her opinion that under present conditions it is dangerous to admit infants into hospital. It is not uncommon to see an infant who has been admitted for some more or less trivial complaint recover from this and later, while still in hospital, develop D. and V., become dehydrated, and die from undiagnosed mastoiditis. Further, many infants during convalescence from a severe air-borne infection also develop D. and V., become dehydrated, and die from undiagnosed mastoiditis.

There are two main reasons for the occurrence of these catastrophes: (1) bottle-feeding while lying down; (2) nursing a sick infant on his back. In both cases in this position mastoiditis is invited by food, vomit, or infected mucus entering the Eustachian tube. Bottle-fed infants should never be fed lying down; while feeding they should always be held in the natural position by a nurse. An infant too young or too ill to sit up or turn over should always be nursed well propped up, and should be turned at frequent intervals, first on one side and then on the other, and never be allowed to lie on his back. If these two simple rules were universally adopted many infant lives would be saved.—I am, etc.,

Liverpool. P. W. LEATHART.

Sciatica

SIR,—I have read with great interest the contributions on sciatica in recent issues of the *Journal*. Would you kindly spare me a little space for a few general observations? It is generally known that sciatica is not a fatal disease, and that most persons who get it are cured in a longer or shorter time with the ordinary methods of treatment. Some few who are cured of the pain carry with them a slight paresis of the leg; others have intermittent bouts of discomfort in their extremity, though not frank pain. I have not heard or seen in 30 years of medical experience any sufferer from the complaint permanently disabled from following his avocation. I was present at the Annual Meeting of the B.M.A. when James Barr of Chicago read his paper on the prolapsed intervertebral disk and its operative treatment, wherein he mentioned that some cases did not even benefit from the operation, and that some others acquired a tolerance that is compatible with a nearly normal life without operation. At that time I formed the opinion that if I got sciatica due to a prolapsed disk I would certainly hesitate to undergo a serious operation with no certainty of cure, and would rather be content to carry on with a partial disability.

It has never been clear to me how the intervertebral disk prolapse occurs. When the semilunar cartilage of the knee gets displaced it is always due to sudden trauma. In the disk prolapse no such cause is observable. Moreover, it is not known whether there are normal people with prolapsed disk who do not suffer from any inconvenience. The discovery of the prolapsed disk with sciatica does not negative the possibility of a prolapsed disk with no symptoms.

It is not my intention to put back the clock of surgical endeavour, but we should not forget that colectomy for bands, adhesions, etc., was in great vogue within living memory. It is admitted that sciatica has a psychological basis: in plain language it suits the patient to have sciatica. Is it unlikely that members of our profession sometimes fall into the same pit when advising a certain line of treatment for their patients? —I am, etc.,

Waterford. A. J. D'ABREU.

Just Suggestion?

SIR,—I have read with the greatest interest the recent correspondence upon the subject of "fibrositis," "sciatica," and "myositis." It would seem that not only are these misnomers but that all methods of treatment hitherto employed for the relief of this dis-ease might well be abandoned without much disadvantage to the sufferer, since each and every one of the therapeutic measures adopted are fundamentally neither more nor less than a combination of auto- and hetero-genous suggestion.

Once this is admitted the sufferer can, with a clear conscience and without prejudice to his chances of recovery, put himself into the hands of the orthodox or unorthodox practitioner according to his predilection or fancy. The admirable letter by Dr. Gallop on suggestion makes entertaining or depressing reading according to one's humour at the moment. It sums up what, I feel sure, often seems "the long and the short of it" to those of us who have had any considerable experience of general practice, especially when one allows a cynicism born of advancing years and length of service to colour one's mental outlook.

Recent letters in your correspondence columns seem to point to the inevitable conclusion that, with the very obvious exceptions of a few specifics, such as the employment of the sulphonamides and penicillin, all forms of therapeutics can be dismissed as empirical, continually being proved to be scientifically unsound, and therefore to be relegated to the limbo of the "magic" of the medicine man. Suggestion, suggestion! is that all that we practise? According to the pundits the balance of evidence would seem to have established this as an indisputable truth. Well, well, and Amen!

However, the real purpose of this letter is to ask a question which very intimately concerns my personal welfare. For many years now I have suffered from recurrent attacks of "fibrositis." I apologize for the use of so unscientific a word, but it is merely to use a term which will convey in the vernacular this painful disability. I have from time to time been "cured" by massage, ultra-violet and infra-red rays, short wave, Droitwich brine. When the exigencies of my work have allowed time for these indulgences, all these therapeutic measures seem to have contributed to the exorcism. Alternatively, when time for these treatments has not been available, "cure" has been spontaneous, unless perseverance with one's work, punctuated *sotto voce* by a wealth of bad language, can be regarded as a sound therapeutic measure. I have received much kindly advice from sympathetic colleagues, from the cheerful instruction to perform the impossible feat of swinging my lame and extremely painful leg over the back of a chair to the extraction of my few remaining teeth and the instalment of a utility set of dining-room furniture. When afflicted I have been physically incapable of carrying out the former, and even when at my worst have not yet adopted the latter, since my own experience, which I now find supported by one of the highest authorities, has convinced me of the fallacy of the focal sepsis theory in the vast majority of cases.

Meanwhile I continue to have attacks as well as long intervals, sometimes very many months, of complete freedom. Is my dis-ease psychosomatic, and if so, what hope have I? Suggestion could obviously not be taken seriously or hope to succeed in my case.—I am, etc.,

Oxford. J. FRANKLAND WEST.

Deep Massage

SIR,—In these days of emphasis on rehabilitation by progressive exercises surgeons may lose sight of the fact that certain soft-tissue lesions, commonly met with at fracture and orthopaedic clinics, cannot be cured—or at best very slowly—by active movements alone. Masseuses should be urged to display their therapeutic powers and thus bring into prominence the essential nature of the services they can give in this part of their field. Surgeons in charge of these clinics are thus asked to co-operate by sending to their masseuse, with a request for deep friction to the site of the lesion, cases of non-specific tenosynovitis at the wrist and ankle; supraspinatus and patellar tendinitis; traumatic and rheumatic lesions of any part of the erector spinae muscle, of the deep lumbar fascia, and of the supraspinous ligaments; injury, whether recent or long-standing, to the internal lateral or coronary ligaments at the knee.

It is not generally realized quite how effective deep massage can be in mobilizing soft structures so placed that active movements alone achieve this end imperfectly or not at all. This fact leads me to request that masseuses should be given a chance to show how indispensable their manual work can be in the proper case. Though the conditions listed constitute only a small fraction of a masseuse's scope, they have been selected for their slow recovery under orthodox treatment and for the spectacular response that adequate friction regularly achieves.—I am, etc.,

London, W.1. JAMES CYRIAX.

Chemistry of Vitamin Therapy

SIR,—In your issue of Jan. 29 Dr. Griffith Evans refers to the Ministry of Health vitamin test scheme, suggesting that no steps were taken to estimate the vitamin sufficiency of the children tested. This is not correct, as in conjunction with, and with the approval of, the Ministry of Health every child in the scheme in Glossop was tested regarding his sufficiency or otherwise in vitamin C by the method mentioned by Dr. Evans, and in addition blood tests for vitamin C were carried out. Further, every child in the scheme was tested for vitamin A by the dark-adaptation test, etc. (the criterion of vitamin-A deficiency being that of Steven and Wald). An account of the work and of the findings was published in the *Journal* of Oct. 16, 1943 (p. 447), by Drs. Kohn, Milligan, and Wilkinson. It will be seen in this paper that in some instances the children having the vitamin capsules did significantly better than those who did not get them.—I am, etc.,

Glossop. E. H. M. MILLIGAN.

Plastics in Splint-making

SIR,—I was glad to see in your issue of Jan. 29 (p. 152) Mr. Campbell's article drawing attention to the value of perspex as a medium for making splints where it is desirable to combine lightness with strength. Undoubtedly this plastic has a great future in the field of splint-making, and I would like to record some simplifications in technique, which are not referred to by Mr. Campbell and which I have found in the course of six months' experimenting with the material.

1. *Softening by Heat.*—If a local kink is wanted it is best to heat the perspex in a bunsen burner; it then remains hot for some minutes, giving ample time for the required shaping. If a large sheet is wanted supple, this is best held over a wide gas-ring. When heated in water it does not stay malleable so long as when dry-heated.

2. *Cutting.*—When heated as above the material is cut as easily as pastry by strong *hot* scissors. Sawing it cold is a very laborious process and very injurious to the saw. The perforations for stitching webbing straps on can be produced by an electric drill on the cold material. If the strap is carried completely round the splint, very few stitch holes are needed, as compared with a strap on one side pulling directly on the stitches.

3. *Moulding.*—When the material has been heated one can mould it most accurately with one's hands if they are protected with a pair of asbestos gloves. Any metal tongs used on the material must be heated, for cold metal cracks the hot perspex. If moulded thus it is rarely necessary to prepare a plaster model first, which is itself a laborious and fairly expensive process, and is particularly tricky for fingers and thumb, the very organs for which perspex is admirably adapted.

4. *Cooling.*—If quick cooling is desired, as when there is no cast on which to bandage the splint while hot, this can be readily induced by exposing the region involved to the cold blast of an electric hair-dryer. If it is cooled too rapidly the perspex becomes brittle, like very highly tempered steel.

I have produced dorsal cock-up splints for foot-drop and wrist-drop (with ring to sole or palm); also abdominal apron for poliomyelitis, and various types for paralysis of the intrinsic muscles of the hand. I am trying it for spines.—I am, etc.,

Bath. M. FORRESTER-BROWN.

Removal of Massive Calculus: Recovery

SIR,—The letter by Mr. J. Armstrong (Feb. 5, p. 200) on multiple vesical calculi recalls to my mind a massive single calculus which I removed from a Mesopotamian Arab in 1917. The victim was a well-known beggar who sat at the entrance to the native bazaar in Amara. He was unable to stand erect, and every few minutes crawled away to squeeze painfully a small quantity of urine from his bladder. I persuaded him to come into hospital, and with the help of the late Capt. J. M. Downie I removed a calculus, with the aid of midwifery forceps, which weighed 2 lb. 7½ oz.

According to local custom the patient's friends removed him from hospital on the day following operation, and carried him to their village some miles away in the marshes. His dressings were discarded, and the wound plastered with warm camel dung caught in a receptacle before reaching the ground. About three months later I saw a small crowd in the bazaar, and on investigation found a man exhibiting the stone at "an anna [penny] a peep." I asked him where he obtained it, and he startled me by pouring out profuse thanks for having cured him. His condition was so much improved that I thought he was an impostor until he threw aside his clothes and exposed a well-healed scar.—I am, etc.,

London, W.1. MCNEILL LOVE.

Tonsillectomy in Children

SIR,—For a long time now articles have appeared in various medical journals, generally backed by statistics, purporting to show that tonsil and adenoid removal in children is at the best useless and even may be harmful. That this opinion, even after many years, is held by a small minority is obvious and, I think, significant. In hospitals up and down the country laryngologists still struggle with nearly overwhelming lists of children for tonsillectomy, urged on by those watchful observers, the paediatrician, the general practitioner, and the school medical officer, who, in turn, are backed by the parents and the school teacher.

I have had the opportunity of observing the effects of this operation over a long period at various hospitals in London, including a large children's hospital, and I have always tried to be impartial in my judgment, both as to results and statistics. That the latter may sometimes unwittingly be fallacious I discovered when, before the war, I examined in a provincial centre over 500 reputed tonsillectomized children, and found that less than 17% had had their tonsils and adenoids adequately removed.

Regarding results, I have always found these to be excellent provided that the well-known criteria for operation were adhered to, and that the tonsils, all the tonsils, and nothing but the tonsils, were removed, and that the adenoids were removed without damage to the Eustachian cushions. It has been my observation that chronic ear and sinus infections are most frequently seen in children with unhealthy tonsils and adenoids, and that an essential factor in the successful treatment depends upon removing this tonsillar sepsis. In private practice, where there is more time to talk with the parents and doctors concerned, one hears in detail of the progress made. I have had parents who, vividly remembering the improvement made in other children after operation, have been disappointed and a little dubious when I have advised against tonsillectomy in another child of the family as unnecessary.

I wonder which camp would claim this case. Last spring I was asked to see a boy of 12 who a few years previously

had had a tonsil and adenoid operation. Subsequently he developed scarlet fever and a chronically discharging ear. On examination of the throat there were large tonsillar remains and much scar tissue. Cervical adenitis and bilateral antral infection were also present. The removal of the tonsillar remains has resulted in a dry ear, with a hearing loss measured audiometrically now trivial. The child has put on weight and the antral condition has now subsided.

I write this letter realizing that it is impossible for one person to cover adequately the ground of even one operation, and that to arrive at a balanced judgment results must be taken from many angles and from many observers.—I am, etc.,

London, W.1. E. CAREW-SHAW.

Cleansing Gas-contaminated Persons

SIR,—I see from your issue of Jan. 29 (p. 163) that my article on teaching "gas" by means of a miniature gas-post has brought forth a torrent of criticism. First I am accused of having made a glaring mistake in publishing a dangerous diagram, and I am told that I should have read the official handbooks. I can only reply by referring Cmdr. Pitt Palmer to p. 89 of *A.R.P. Handbook*, No. 1 (2nd ed.), where he will see the eye douche in the same position. This also is the position it occupies in the latest circular issued by our local authority. I entirely agree with him that liquid gas in the eye must be removed at the very earliest moment and that it is best done with *warm* water, but warm water is not available immediately in an outer shed, nor are the conditions there suitable for eye douching at night.

Cmdr. Pitt Palmer quotes my words "not to instruct, but to show how instruction may be given." He then goes on to say that, according to the diagram, the patient must go through endless formalities with labels, string bags, etc., and eventually be undressed before his eyes are attended to. May I ask in which part of the diagram (which does not illustrate technique) is a patient shown passing through with contaminated eyes? Or can he quote one single word in the article which suggests that we practise as he asserts that we do? He remarks that the basis of all training is common sense; but he is not very generous in accrediting this virtue to others.

That the patient is taken to the eye-douching section immediately, and is undressed after his eyes have been attended to, is merely complying with the instructions given in *A.R.P. Handbook*, No. 2 (4th ed.), p. 12, which states: "The patient should be directed at once to the place where the eye douching is to be done, notwithstanding that this is a departure from normal procedure." That the patient should not be undressed first was clearly indicated, even in the amendment to the 3rd ed., p. 13, where the words "the casualty, who will have been undressed" were deleted. On the same page the following words were added: "Care should be taken to avoid, as far as possible, his coming into contact with persons who have removed their contaminated clothing," which suggests that the eye douching has been carried out indoors.

In reply to the sarcastic "eye douche (singular)," may I remind your correspondent of the obvious—i.e., that the miniature gas-post was for teaching only, and was never therefore intended for full practice, which is still given in a fully equipped gas-post. I am pleased to assure Cmdr. Pitt Palmer that we have a supply of antigas ointment at the "dirty" end of our gas-post. It was not considered necessary to mark small items of equipment on the diagram, which was intended to indicate solely the general lay-out of a gas-post.—I am, etc.,

Edinburgh. POLLOK DONALD.

Emulsions

SIR,—Dr. W. F. Cooper is to be congratulated on his letter of Jan. 29. Its implied criticism is applicable to every dermatologist, and indeed every physician who has the temerity to sign his name to a prescription. A moment's thought on Dr. Cooper's letter induces a realization of almost complete ignorance as to how medicament reaches tissue or bacteria, and of the physical rules governing such contact. Few of us consider how this last can be rendered more intimate. So far as I am aware there is no dermatologist to-day with the necessary mathematical or physiochemical knowledge to follow up Dr. Cooper's "provocation"—a matter for regret. It is to be hoped that a physical chemist with an interest in medicine will some day arise to answer the demand.

Is it too much to hope that paraffin molle and aqua pura will be finally relegated to the realm of "inert" vehicles and replaced by co-operative rather than passive diluent?—I am, etc.,

Manchester. P. B. MUMFORD.

Collaboration in Hospital

SIR,—The Medical Council of St. Bartholomew's Hospital recently celebrated the centenary of its formation. The resolution forwarded to the medical officers by the Governors in July, 1843, was as follows:

"That a Medical Council be formed to which may be referred matters relating to the Medical department of the Establishment, and to the Medical School.

That the Council do consist of the Physicians, the Surgeons, the Senior Assistant Physician, the Senior Assistant Surgeon, and a Secretary, to be appointed according to rotation from the four remaining Medical Officers, and that the Senior Member present at the commencement of Business do take the Chair.

That in the event of any of the said Physicians, Surgeons, Assistant Physicians, or Assistant Surgeons lecturing at, or being in any way connected with any other School than that of this Hospital, he, or they shall be disqualified from acting as Members of the Council.

That all business brought before the Council shall be decided by the majority present, except such matters as are to be submitted to the Treasurer, and Almoners, or Governors, when every Member of the Council be required to attend, and no decision of such Council shall be conclusive unless the majority acquiesce therein.

That in all the reports of proceedings submitted to the Treasurer, and Almoners, or the Governors, the names of the Members present shall be stated.

That all business referred for the consideration of the Council from the Governors be inserted in the summonses convening such Meeting."

This step was taken so that the treasurer and almoners might consult the hospital staff on matters of medical importance. In view of the present emphasis upon medical reorganization it was thought that the matter might be of interest to your readers.—I am, etc.,

St. Bartholomew's Hospital. F. C. W. CAPPS, Hon. Secretary, Medical Council.

The Doctor's Vocation

SIR.—J. S. Fairbairn's death has been recorded with many appreciations of his life's work. The tone of these appreciations has brought to my mind the following excerpt from a letter of a father to his son:

"I have been thinking very anxiously over your letter. We must now decide what you are to be. There is indeed nothing I could more desire than to see you a good doctor; and a good doctor you will be if you are a good man working for the right reasons.

"There is no harder life than a doctor's; but so far as it is mere hard work it is not to be feared. What does not involve labour is not worth doing. But think of this: a doctor has to care for human life—he has suffering and disease to cure. The living look to him to save the dying and the dying look to him for life. You can remember from our experience of last year how much unnecessary pain a doctor's error of judgment may cause; and mother can tell you of many cases where an error of judgment has had more serious results—has caused loss of life. But we know also how much a doctor may do for a patient—Dr. Keith saved our dear Barbara; we shall never cease to be grateful to him for the kindness and skill which gave her back to us. And many a life he has so saved.

"Now do you know why I am saying this? To make you understand the grave responsibility of choosing such a profession—I would not have a son of mine enter it unless it were to do his duty in it; and his duty is to use all his energies and efforts to lighten the suffering and sorrow of man. What this means you cannot as yet fully know, but if you feel that you can be the best possible and do the noblest possible by being a doctor, then a doctor, so far as I can help you, you shall be. And I will stand no longer in the way of your practical chemistry. . . .

"When you were a little child, I often thought how willingly I would consent to be nothing and do nothing in the world if I could

only make you a good man! And I feel so still—anxious only to see you one who could serve your God and your kind! If you do that, I shall be happy to be remembered only as your father. . . ."

The son was about to choose medicine as a career. The father was Andrew Martin Fairbairn and the son was J. S. Fairbairn. The letter was dated April 12, 1884, and was published in *The Life of Andrew Martin Fairbairn*.—I am, etc.,

Carmarthen. J. R. E. JAMES.

A Health Journal for the Layman

SIR,—I am perturbed by a certain class of literature on "health," "hygiene," "psychology," "sex problems" which is in circulation in the form of magazines, booklets, correspondence courses, and the like. This type of publication does not usually come the way of practitioners, but those who took pains to look into it would be astonished at the extraordinary jargon which is hashed up and dished out for popular consumption. If there are people with a sincere desire for expert instruction, then it would not seem to be in their best interest that their need should be exploited by what may fairly be described as the pseudo-scientific press.

It is highly dubious whether the available material serves any worth-while social purpose; and there is no doubt that in some cases harm may result. For example, there are individuals who, acting on directions, persevere in douching the nose with irritating fluids for the treatment of a cold or to prevent further colds. As might be expected, what usually happens is to prolong the cold into a period of months with the danger of spread of inflammation into the Eustachian tubes. More ominous is the case of a young woman who, following a course of instructions to the letter, was resolute to rid herself of dreams by "sheer force of willing." The disastrous effect on the mental state of such a devastating procedure can well be imagined. Some fantastic things are perpetrated under the guise of "psychological" drilling. I dare say that most practising doctors could mention similar incidents.

Cranks there will always be, but there are others with a genuine desire for knowledge and guidance, and the normal healthy-minded person would be the first to welcome clarification of topics relevant to the health of the individual and the social body. I venture to suggest that, in the light of the present conception of social medicine, the time is opportune to offer to the general public full facility for rational approach to authentic and up-to-date information and authoritative views. True, something is already being done: broadcasts by doctors, lectures on psychology, publication of pamphlets are steps in the same direction; but not everyone can listen to broadcast talks or attend lectures, and pamphlets may not get through to the populace. It may be that certain aspects of health education could be effectively presented in the form of a journal; there is something personal and vivid about a current periodical with familiar lay-out and features and that sense of news fresh from the print. And the art of attractive composition is not entirely foreign to medical writers. I suggest there would be scope for the right kind of health journal and that this would be a useful social asset.—I am, etc.,

Salford. JOSEPH PARNESS.

Consultant and Specialist Services

SIR,—Certainly Mr. H. J. McCurrich (Jan. 29, p. 158) has reason for being perturbed about the totalitarian methods which are being employed to frame the future of consultants. As nine out of ten consultants in the United Kingdom are not attached to undergraduate teaching hospitals, it is difficult to understand why nine out of ten of the committee selected to meet the Minister of Health in connexion with the Beveridge scheme were drawn from the staffs of undergraduate teaching hospitals. Can it be that the Minister's primary consideration is the betterment of undergraduate teaching, which indeed is in need of reform; or, midst this oyster-like secrecy, are we to assume that for the present the welfare of the "herrenvolk" of consultants is the Minister's first concern? As time goes on, perhaps we may look forward to a plebiscite of the remaining nine-tenths of the consultants.—I am, etc.,

HAMILTON BAILEY.

Obituary

E. R. MORTON, M.D.TOR., F.R.C.S.ED.

News has been received of the death in retirement at Gullane, East Lothian, of Dr. E. Reginald Morton, who in former years was a leading radiologist in London, holding the post of medical officer in charge of the electrical department of the London Hospital and later that of radiologist to the West London Hospital.

Edward Reginald Morton, son of Edward D. Morton, M.B., was born in Barrie, Ontario, on Oct. 14, 1867. He graduated M.D., C.M. at the University of Toronto in 1890, and took the Scottish Triple qualification and the D.P.H. in the following year; in 1893 he became F.R.C.S.Ed. Soon after graduation he accompanied Lord Brassey on the yacht *Sunbeam* as medical officer on a voyage to Australia and then for a short time assisted his father in practice. After the discovery of the *x* rays by Roentgen, Morton took a keen interest in the medical possibilities of the new rays and became one of the pioneers in this country. He was then in general practice at Taunton, experimenting with *x* rays in his spare time. His work soon attracted attention, and in 1904 he moved to London and was appointed to take charge of the electrical department of the London Hospital. In 1909 he gave up that post and became medical officer in charge of the *x*-ray department of the West London Hospital and lecturer in radiology at the West London Postgraduate College. During the last war he acted as radiologist to No. 2 London General Military Hospital, and after the armistice he visited Erlangen in Bavaria, where his friend Prof. Schrumpf had been developing deep *x*-ray therapy during the war. On his return Reginald Morton introduced the new technique to this country. In 1922 he accepted an invitation to lecture on the subject in the U.S.A. and Canada. He made an extended tour of both countries and gave many lectures in Toronto, New York, Los Angeles, and other cities. On that tour he was accompanied by his old friend General Fotheringham, R.C.A.M.C.

Morton was a past-president of the Electrotherapeutic Section of the Royal Society of Medicine and a corresponding Fellow of the Academy of Medicine of Toronto and of the *X*-Ray Society of North America. He joined the B.M.A. in 1897, was secretary of the Section of Therapeutics in 1906, and president of the Electrical Section at the Annual Meeting of 1908. He published *Essentials of Medical Electricity and Radiology* in 1910, and five years later a *Textbook of Radiology*, which reached a second edition. In 1926 he retired to his summer home at Westbourne, Gullane, where he lived happily until his death on Jan. 21.

JOHN BARLOW, M.D., F.R.C.S., F.R.F.P.S.G.

Dr. John Barlow, whose death took place at his home in Callander on Dec. 27, 1943, was the oldest member of the medical profession of Glasgow. He was born in 1853 at Leigh, near Manchester. He studied medicine in Anderson's College, Glasgow, and at Glasgow and Edinburgh Universities, graduating M.B., C.M.Ed. 1875, and M.D. 1879, having previously qualified M.R.C.S.Lond. in 1874. In 1881 he became F.R.F.P.S.Glas., and in 1885 F.R.C.S.Eng. He devoted himself in his early years to physiology, first as assistant to Prof. McKendrick in the University of Glasgow, then as the first Muirhead demonstrator in physiology in the Royal Infirmary School of Medicine, and later as professor of physiology in St. Mungo's College, into which was absorbed the Royal Infirmary Medical School. He lectured in physiology at the Royal Technical College of Glasgow, and was, in addition, a most acceptable lecturer to popular audiences. His training and intimate knowledge of physiology proved of great service when he began work in surgery, his real professional objective. In 1892 he was appointed visiting surgeon to the Royal Infirmary of Glasgow, and on retirement in 1913 was appointed honorary consulting surgeon.

Dr. Barlow took an active part in the work of the Royal Faculty of Physicians and Surgeons as examiner and as a

member of council, and finally, from 1913 to 1915, as president. He was a fluent and telling teacher of both physiology and surgery, and, although making no claims in originality or in research, he did good safe work. Some of his contributions to these subjects were "Physiological Action of Ozonized Air," *Journal of Anatomy and Physiology*; "Statistics of Surgical Operations, 1883–1892," *Glasgow Medical Journal*; and "Intussusception in Infants treated by Abdominal Section," *Lancet*, 1899. Three members of his family became members of the medical profession; one of his daughters is the wife of Mr. George Mowat, surgeon to the Royal Infirmary, and is doing wartime work in the Eye Infirmary, Glasgow.

SIR JOHN RAMSAY, C.B.E., M.S., F.R.A.C.S.

A Reuter message from Melbourne has announced the death of Sir John Ramsay, a former president of the Tasmanian Branch of the British Medical Association, and for 14 years surgeon-superintendent of the Launceston General Hospital, Tasmania.

John Ramsay was born in Scotland on Dec. 26, 1872, son of John Ramsay and Margaret Thomson. In early life he went to Australia and studied medicine at Melbourne University, graduating M.B., B.S., and afterwards proceeding to the M.S. degree. He then made his home in Tasmania and became consulting surgeon to the public hospital at Launceston. During the last war he served with the rank of major as surgeon to the 12th Australian Hospital in Tasmania, and for his military services was created C.B.E. After his retirement from the post of surgeon-superintendent of the Launceston General Hospital he was elected consulting surgeon. Sir John Ramsay was one of the founders of the Royal Australasian College of Surgeons in 1926; he served for six years (1920–6) as president of the Tasmanian Branch of the B.M.A., and had been elected a member of the Association as long ago as 1894. He was created a knight in 1939, his name appearing in the New Year Honours List for services to surgery in the Commonwealth of Australia. He had been a keen cricketer in early days, kept up his interest in golf, and was the first president of the Rotary Club of Launceston. He married Ella Elizabeth Pegus Dudley of London, and had three sons and two daughters.

MOHAMMAD HUSNAIN, O.B.E., M.B., F.R.C.S.ED.

Prof. Mohammad Husnain, head of the department of ophthalmology at the Prince of Wales Medical College, Patna, died suddenly at Patna on Sept. 10, 1943, in his forty-seventh year. To those who knew him well and had had the privilege of working with him the news of his death brought a deep sense of personal loss. In him the Medical College lost a very able teacher and the medical profession lost an eminent ophthalmic surgeon.

Prof. Husnain was educated at the Calcutta Medical College, and obtained the M.B. degree of Calcutta University in 1921. He joined the Provincial Medical Service in Bihar the same year and was posted to the public health department. In 1925 he was appointed house-surgeon in the department of eye, ear, nose, and throat of the Medical College Hospital at Patna, and later worked as house-surgeon in the general surgical wards in the same institution. In 1929 he proceeded to Europe, and obtained the diplomas of D.L.O.Lond. and D.O.M.S.Lond. In 1930 he was admitted as a Fellow of the Royal College of Surgeons of Edinburgh. Later he worked as house-surgeon at the Birmingham and Midland Ear and Throat Hospital for 8 months. On his return to India in 1931 he was appointed lecturer in ophthalmology at the P.W. Medical College, Patna, and in 1935 he was made professor in the subject. He was a Fellow of the Patna University and a member of the Faculty of Medicine and Board of Studies in Medicine. He was a member of the Bihar Branch of the British Medical Association and was president of the branch in the year 1942. He was made an O.B.E. in the New Year Honours List of 1943. He leaves behind a widow and a large circle of friends and admirers to mourn his loss.

The Bihar Branch of the B.M.A. has passed a resolution placing on record its deep sense of sorrow at the premature death of Prof. Husnain, a member of the Association since the inception of the Branch and one of its ex-presidents.

News has been received of the death at Cannes in October of Dr. ARCHIBALD ADAM WARDEN, from whom only occasional messages had come through since the fall of France. Born in Edinburgh on May 11, 1869, Dr. Warden was educated at Rossall School and Glasgow University, where he graduated M.A. in 1889, M.B., C.M. in 1893, and M.D. in 1898. After serving as resident in the Western Infirmary, Glasgow, under Sir Hector Cameron and Dr. Samson Gemmell he went to the Hertford British Hospital in Paris as R.M.O. and received the diploma of Docteur en Médecine de la Faculté de Paris in 1899. He then started private practice in that city and became physician to the British and the American Hospitals, and soon secured a large clientele. He extended his work to Cannes, and some 20 years ago left Paris to devote himself to medical practice in Cannes and its neighbourhood. During the last war he served with the British Forces at a hospital at Dieppe. Dr. Warden had been a well-known lawn-tennis player, both as a student and afterwards in France, where he won the French doubles championship with W. S. M. Vines in 1896; he was also a very early motorist and an enthusiast for the open-air life in summer and winter. He was for some years an occasional contributor to the *Lancet* and the *B.M.J.*, and at the time of his death was known to be working on *The Reminiscences of a Scots Doctor in France*. Dr. Warden's visits to Scotland were rather infrequent, as he preferred that his British friends should spend holidays with him in the South of France; he attended the British Medical Association Meeting in Glasgow in 1922, when Sir William Macewen was President. His wife is a daughter of the late Prof. McKendrick of the Chair of Physiology in Glasgow University. He is survived also by a daughter and two sons, one of whom is a prisoner of war in Japan.

The death occurred on Oct. 26, 1943, of Dr. HUGH JOHN O'PREY at his home in Antrim Road, Belfast. Born at Portaferry, Co. Down, in 1885, he graduated M.B., B.Ch., B.A.O. of the Queen's University of Belfast in 1918. After a year as house-surgeon in the Mater Infirmorum Hospital, Belfast, he was clinical assistant in the Samaritan Hospital for Women, London. For more than twenty years Dr. O'Prey carried on an extensive family practice and established his reputation as a skilful and resourceful obstetrician. His fatal illness became apparent some months ago, and he faced its inevitable end with faith and courage. He is survived by his wife and two children.

News has reached this country of the death of Dr. ROBERT DONALD FLETCHER on Dec. 13, 1943, from coronary occlusion, in Hollywood, Florida. Dr. Fletcher was born in Edinburgh on July 16, 1878, and was educated at Watson's College, Edinburgh, and graduated M.D. at the University of Manitoba in 1903. He practised medicine in Winnipeg and was professor of urology at the University of Manitoba, from which he retired about 1936. He was a member of the British and Canadian Medical Associations and of a number of American urological societies. He is survived by his wife and three daughters.

We regret to announce the death on Jan. 26 at his home at Skinburness, Carlisle, of Dr. JOHN WELSH SMITH. He studied medicine at the University of Edinburgh and graduated M.B., C.M. in 1890; thereafter for 45 years he gave faithful service as medical officer to the parish of Dunscore, Dumfriesshire. Dr. Smith joined the British Medical Association in 1894, and was chairman of the Dumfries and Galloway Division in 1933–4 and president of the Border Counties Branch in 1936–7. He was very well known socially and professionally in the South of Scotland, and his election to these two offices in the B.M.A. gave proof of the esteem and regard in which he was held by his colleagues. Possessed of many attainments, he travelled on sea for several years before settling down in general practice at Dunscore. He took a keen interest in languages, including ancient Greek and Arabic, and he also spoke a number of modern languages quite fluently, including French, Russian, and German.

Dr. TOM STANSFIELD, honorary consulting physician to the Royal Berkshire Hospital, Reading, died on Jan. 25, aged 57. A student of Guy's Hospital, he graduated M.B., B.S.Lond. in 1910 and then became house-surgeon to the Dorset County Hospital, Dorchester. During the last war he served with the rank of temporary captain, R.A.M.C., and after returning to civil life in 1919 was appointed physician and medical officer in charge of the special eye department at the Royal Berks Hospital. Dr. Stansfield joined the British Medical Association in 1917, was chairman of the Reading Division in 1936, and had been president of the Berks, Bucks, and Oxford Branch. Dr. Tom Stansfield (writes S. C. A.) spent most of his life in Reading, where his father was in practice. After leaving Guy's he worked for a short time in Birmingham and Taunton, and

then, on the outbreak of war, volunteered for the R.A.M.C., with whom he spent the next four years. He was wounded in the head. After the war he settled with his father in Reading and continued the practice alone after his father's death. He was never in robust health, and was unable to carry on his work at all since last May. Two years ago he resigned his position as assistant physician at the Royal Berkshire Hospital, a position he had held for 21 years. He was always a very active member of all medical organizations in the district. He was honorary librarian to the Reading Pathological Society for many years. He was a past-chairman of the Reading Division as well as the Berks, Bucks, and Oxon Branch of the B.M.A. For twelve years he was chairman of the Reading Insurance Committee and for a longer period he served the profession as chairman of the Reading Panel Committee and the Borough of Reading Medical Society. He was a valuable member of the Reading Medical War Committee. From his father, who was the greatest authority on British ferns in his time, he inherited a great love of natural history. Some years ago he was elected a Fellow of the Linnaean Society. He also acted as secretary of the Pteridological Society. Dr. Stansfield will be sadly missed by his colleagues in Reading.

Dr. ARVID LUDVIG KELLGREN, who died in London on Jan. 31, was born at Alingsäs in Sweden on April 25, 1856. He decided to follow in the footsteps of his elder brother, the well-known medical gymnast Henrik Kellgren, and graduated at the Royal Central Gymnastic Institute of Stockholm during 1879. He then determined to study medicine and went to Edinburgh, where he graduated as M.B., Ch.B. in 1886. After this he devoted himself entirely to the practice of medical gymnastics according to the methods of Ling and his brother Henrik. During 1888, for his successful treatment of the Empress of Austria, he became the recipient of the Austrian Imperial Order of the Iron Crown. During the same year he demonstrated the Ling-Kellgren methods at the Naval Hospital at Pola, and an extensive paper on them was published in the *Stat. Sanber. d. K.K. Kriegsmarine* for 1888. This communication formed the basis of his thesis which was accepted with commendation for his graduation as M.D.Ed. in 1890, under the title of "The Technic of Ling's System of Manual Treatment." These two works contained the first detailed description of Henrik Kellgren's so-called "nerve frictions and vibrations," and the thesis mentioned was translated into French, German, and Italian. Kellgren made a number of researches on the physiological effects of massage and vibrations which were duly published in *Clin. franç.*, 1894, *C. r. Soc. Biol.*, 1895, and *Arch. de Physiol.*, 1896. Further researches, made in conjunction with Dr. Carlo Colombo of Rome, were issued in book form during 1897 under the title of *Absorption of Exudations under the Influence of Massage*. A paper with practical demonstrations on new movements in manual treatment was read by him before the International Congress of Medicine at Rome in 1894. At the hands of the King of Sweden he received the decorations of Knight Commander of the Vasa and Knight Commander of the North Star.

Dr. MAYNARD HORNE, who was born on March 30, 1870, and died at Rickmansworth on Feb. 7, 1944, was educated at Haileybury, Trinity College, Cambridge, and St. George's Hospital Medical School. He was for a time in general practice, and served for many years as physician to the Margaret Street Hospital for Consumption; but most of his professional career was devoted to the specialty of anaesthetics. Having qualified M.R.C.S., L.R.C.P. in 1899, and taken the M.B., B.Ch. at Cambridge in 1901, he held house appointments at his own hospital, which he served also later as anaesthetist and where he was made consulting anaesthetist on his retirement. He had also been anaesthetist to the Hospital for Women, Soho Square, the Seamen's Hospital, Greenwich, and the National Orthopaedic Hospital. He had an aptitude, almost a genius, for friendship—Polonius would have liked to know him. He married, while still a student, Lillie, daughter of the late Mr. T. Pearson, and had one son and two daughters. He was a highly expert and enthusiastic lawn tennis player; and when already a grandfather could often astonish men many years younger by his activity and the high standard of his play. During the first world war he served as a captain in the R.A.M.C.(T.) at base hospitals in France. He was a colleague whose friends will sadly miss his cheery personality.

The following appreciation of Lieut.-Col. DONALD UVEDALE OWEN, whose death on active service was announced in the *Journal* of Jan. 8, has been received from a Liverpool colleague: Donald Owen had been away from us right from the beginning of the war, called up for service as a Territorial officer. Before long he was in charge of a general hospital, which he later took to the Middle East. His experience in tropical diseases led to specialized work in that field, and last year he was mentioned in dispatches for distinguished services. Then came the news of his illness—how serious many of us hardly realized until we heard that on his way home he had to be put off the ship and left behind in South Africa, there to have weekly blood transfusions for an aplastic anaemia. Donald was a first-rate clinician, all the sounder for the time he had spent with Warrington Yorke as clinical pathologist to the Liverpool School of Tropical Medicine. With his election to the staff of the Royal Southern Hospital, he transferred his energies to general medicine, and after a few years there he became assistant physician to the Royal Infirmary. Among various papers which he published two of them stand out as illustrating his quality—a careful study of urobilinuria, done in Yorke's department, and a sensible, illuminating re-examination of Pancoast's "superior sulcus tumour," in collaboration with Hewer and Whittaker. His patients, private or "hospital," were always impressed by the apparently endless time and care which he was ready to give them—even though it often meant that he was late for the next consultation; they used to say of him that he never seemed to be in a hurry to get away from them. He enjoyed his medical work, and he enjoyed life. He was a foundation member, and the first president, of the Innominate Club, the most junior of the medico-literary clubs in Liverpool. He was a keen tennis player, and he and a gynaecological colleague made up a doubles pair for Mersey Bowmen. Dancing, parties, students' dinners, all sorts of human contacts, he enjoyed them all, and in so doing made them pleasant for other people and especially for his friends. Good-natured, tolerant, and friendly, he nevertheless held firm and shrewd views. Had he come back to us safe and sound he would have been a tower of strength in the changing world of medicine which is upon us.

Dr. John Cahill writes: It is perhaps permissible for one who was closely associated with the late Prof. W. M. FALLON in his student days in Galway to pay a personal tribute to his memory. At that time, when he laid the foundations of his career, I could not help noticing his eager mind and the ease with which he combined interest in politics with interest in physiology. The event was to prove that he also possessed a still more valuable asset—the uncommon gift of *vision*—which enabled him to plan his career wisely from the beginning. Even a man of great ability—e.g., Wolsey—may lack this gift; of most of us, the words of Seneca ring true eternally—*Ignoranti quem portam petet, nullus suus ventus est* (When a man does not know which harbour he seeks, no wind is the right wind). Years later, we spent a jolly afternoon together on the upper reaches of the Thames. He had just completed a course of study abroad and was full of ideas, full of enthusiasm. I never saw him again.

A correspondent writes: Medicine has lost a personality and a pioneer by the passing of HERBERT NOTT at Guildford on Feb. 2. After many years in practice at Long Sutton, near Birkenhead, Nott fell ill and was restored to health by colonic lavage with potassium permanganate. His interest in the treatment was stimulated and he used it extensively in a large practice. The success which followed led to the co-operation of several medical men, and in July, 1926, he published a paper in the *British Medical Journal* on thyroid and manganese in acute pneumonia. He went to live at Guildford and devoted his time to specialization in this treatment, and finally his book *Thyroid and Manganese in Treatment* was published. His implicit belief in the value of thyroid and manganese convinced a considerable number of medical men, but the lack of interest and even active opposition displayed by a section of the profession, including the Medical Research Council, were always a source of disappointment to him, and to the last he fought and strove to gain that general recognition for his technique which would allow humanity to reap the full benefit therefrom. Those who knew Herbert Nott will remember him as a good companion, a fine talker, and a firm friend, but he was a tough antagonist who did not easily tolerate criticism which was not based on practical experience, and his discoveries have not yet been sufficiently appreciated. Now that the value of trace elements such as manganese, zinc, and cobalt is beginning to be recognized and the all-important part played by the liver is becoming more and more apparent, it is probable that his pioneer work on these subjects will receive a far greater recognition from future generations in medicine than it has in the past.

The following well-known medical man has died abroad: Dr. LEO BUERGER, professor of urologic surgery at the New York Polyclinic Medical School, who gave his name to thrombo-angiitis obliterans in 1908, and was author of *Circulatory Disturbances of the Extremities*, aged 64.

Medico-Legal

USE OF A MEDICAL ASSESSOR

Many county courts have for long followed a practice in workmen's compensation cases by which the medical assessor examines the workman and reports his opinion to the arbitrator (the judge). The House of Lords has now ruled that this practice is wrong.[1]

A workman was ruptured at work and received compensation for total incapacity. He underwent an operation, but this was not completely successful. A few years later the employers required him to undergo a further operation. He refused, and they applied to the county court for a review or termination of the weekly payments on the grounds that his refusal was unreasonable. Sir Gerald Hurst, K.C., the arbitrator, was assisted by Dr. W. A. Brend as medical assessor. The employers called three doctors, who said that the operation was advisable and could be successful. The workman called two other doctors, who said the operation would be positively injurious to the man's nervous condition, and that his previous operation had left him with a neurosis. The arbitrator said that the medical assessor would like to examine the workman. This examination took place in private out of court, and when the hearing was resumed the arbitrator intimated that the medical assessor's view was in favour of the proposed operation. After further argument from counsel he gave judgment for the firm, saying that he thought he was entitled to rely upon the advice of the medical assessor, who took the view that the operation would have no effect upon the workman's (nervous) condition. It was not dangerous, and he held the workman's refusal to have been unreasonable. He accordingly ordered that all payments should be suspended. The workman appealed unsuccessfully to the Court of Appeal and then to the House of Lords. The Lord Chancellor, Viscount Simon, pointed out that, as was held by their lordships recently,[2] the question of reasonableness is not to be determined by considering whether the best medical opinion would think the operation advisable or safe, but whether the workman, having regard to all the circumstances, including the advice of his own doctor, was unreasonable in refusing it. In other words, the court must consider the mind of the workman rather than the medical facts. The House, however, had another and wholly distinct reason for allowing the workman's appeal: that the arbitrator had wrongly allowed himself to be influenced by the medical assessor's advice. An arbitrator may submit to a medical referee for report any matter which arises in the arbitration, but whenever a referee examines a workman he must make a written report or certificate which is available to both parties. A medical assessor, said the Lord Chancellor, is one of the panel of medical referees, but that does not oblige the workman to submit himself for examination, and cannot constitute the assessor an unsworn witness who cannot be cross-examined and whose testimony need not be fully stated to the parties. The assessor is an expert whom the arbitrator may consult on the effect and meaning of technical evidence; he may in proper cases suggest to the arbitrator questions to put to an expert witness, and the arbitrator may ask him what inferences may properly be drawn from proved facts, or the extent of the difference between apparently contradictory conclusions of experts. Their lordships have now ruled that it is not part of his functions to conduct a personal examination of the workman, or to report to the arbitrator the effect of the examination and his deductions from it. The Lord Chancellor added that the arbitrator may, when faced with a conflict of medical evidence, submit the medical issue to the assessor as a referee, but then the report will be in writing and available to the parties. The medical referee is not, of course, exposed to cross-examination.

CONSCIENTIOUS OBJECTION BY A HOMOEOPATH

The High Court dealt in January with an unusual appeal[3]: by a practitioner of homoeopathy against an order to serve as a junior medical officer, on the ground that he had a conscientious objection to giving "allopathic" treatment. Dr. Arthur George Davies of Cardiff was directed by a national service officer under Defence Regulation 58A to perform services in the United Kingdom as a junior medical officer at the Park Hospital, Wellingborough, for a period of six months. He failed to comply with the direction and was prosecuted before the stipendiary magistrate. At the hearing it was proved or admitted that he had a conscientious objection to giving "allopathic" treatment and that he would be required to do so. He was convicted of a breach of the regulations and fined £5 and £10 costs. He appealed, and the magistrate stated a case for the Divisional Court. Dr. Davies contended there that the national service officer had not acted in good faith in directing him to perform services which the officer knew that he had a conscientious objection to giving, he having expressed his readiness to perform medical services on homoeopathic lines; he also pleaded that, being a homoeopath, he was incapable of performing the services he was directed to perform. The Ministry contended that the officer had acted in good faith and that a conscientious objection by the doctor was not a relevant matter of defence.

Mr. Justice Humphreys, giving the judgment of the court, said that while he had every sympathy for anyone called on to do anything that was in direct conflict with his convictions and beliefs, the decision of the magistrate was right. The court had to decide whether the officer's direction was lawfully given, and was bound to approach the case on the basis that he was a fair-minded person. It was for the officer to make up his mind whether a person called on to perform certain duties was "capable of performing" them. In the court's opinion the direction complained of was properly given and the doctor was a person capable of performing the duties required of him. His appeal was therefore dismissed.

By Regulation 58A any national service officer may direct any person in Great Britain to perform such services as may be specified by or described in the direction, being services which that person is, in the opinion of the officer, capable of performing. There is no appeal against a direction given by the officer, and conscientious objection is only recognized in connexion with service in the armed Forces. Dr. Davies's case was therefore not contemplated by those who framed the regulation. A question that comes to mind is: What have other homoeopathic practitioners done in similar circumstances? Without knowing the facts it is hardly proper to comment on the case.

[1] Richardson *v.* Redpath Brown and Co., Ltd., (1944) 1 All E.R., 110.
[2] Steele *v.* Robert George and Co., 1942) A.C., 497.
[3] *Times*, Jan. 13, 1944.

The Services

Capt. P. A. Forsyth, R.A.M.C., repatriated prisoner of war, has been mentioned in dispatches in recognition of gallant and distinguished services in the field before his capture.

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Capt. (temp. Major) W. E. Tucker and Capt. A. D. Aveling, R.A.M.C., repatriated prisoners of war, in recognition of gallant and distinguished services during and before captivity; and also of Temp. Surg. Lieut. J. H. L. Ferguson, R.N.V.R., for gallantry and great skill in rescuing and caring for wounded survivors from H.M.S. *Cromarty*.

CASUALTIES IN THE MEDICAL SERVICES

Previously reported missing at sea, now presumed to have lost his life.—Lieut. R. A. Palmer, R.A.M.C.

Missing, presumed killed.—Temp. Surg. Lieut. P. G. Jeffries, R.N.V.R.

Wounded.—Temp. Surg. Lieut. J. C. Bulstrode, R.N.V.R.

DEATHS IN THE SERVICES

Col. CHARLES EDWARD HARRISON, C.M.G., C.V.O., A.M.S., died on Jan. 25 at Redhill while in his 92nd year. He was the son of John Harrison, who was born in July, 1787, so the two lives span the remarkably long period of 157 years. The father, John Harrison, was appointed assistant surgeon to the First Foot Guards in 1809 and served during that year in the ill-fated Walcheren Expedition, and subsequently in the Peninsular War in 1911–13, in Holland in 1814, and at the Battle of Waterloo in 1815. In 1824 he was battalion surgeon, Grenadier Guards, and only retired in 1840. His distinguished son, Col. Charles Edward Harrison, was born in 1852 and was educated at Wellington College and St. Bartholomew's Hospital; he passed the London M.B. with honours in 1876 and took the F.R.C.S.Eng. in 1878, having first qualified as M.R.C.S. and L.S.A. in 1874. He entered the Army in the same year as surgeon to the Grenadier Guards, like his father just fifty years earlier. He rose to be surgeon-major in the same famous corps in 1885, was promoted to the now long-extinct rank of brigadier surgeon lieut.-colonel, Brigade of Foot Guards, in 1891, and to brevet colonel in 1907. In the year of his retirement, 1909, he was awarded the C.V.O. His war service included the Battle of Tel-el-Kebir in Egypt in 1882 (medal with clasp and star) and a period in France during the last war in 1914–15, when, in addition to medals, he was given the C.M.G. During his long service he also held the important posts of charge of the Queen Alexandra Military Hospital, the 1st London General Hospital, and was Assistant Director of Medical Services; he was appointed Hon. Surgeon to King Edward VII. His energies after his retirement from active service included command of a convalescent hospital in 1916, work in the Ministry

of National Service in 1918, and in the Territorial Force Reserve in 1918–23. It will be long before the Army medical record of himself and his father is equalled. The funeral took place on Jan. 28 at Redhill with full military honours. Major-Gen. O. W. McSheehy represented the Director-General, Army Medical Services, and the Grenadier Guards sent an unarmed escort of pall-bearers with buglers who sounded the Reveille and Last Post.

Medical Notes in Parliament

Consultant and Specialist Services

Sir DOUGLAS HACKING inquired on Feb. 3 whether the Minister of Health had considered the letter about consultant and specialist services appearing in the *British Medical Journal* and the *Lancet* of Jan. 15, signed by the Presidents of the three Royal Colleges, which stated that these colleges were at his request making a survey of the present availability of consultants and specialists. Mr. WILLINK said he had considered this letter. Surveys of the hospital services had been in progress throughout the country for some months. Their aim was to assist in producing plans for the co-ordination of those services after the war by ascertaining the supply of and probable demand for hospital facilities, and by making recommendations for any necessary extensions and improvements. At an early stage of these inquiries it became clear that a useful purpose would be served by the initiation of similar inquiries in England and Wales into the supply and distribution of consultants and specialists and the probable demand for them in a comprehensive post-war hospital and consultant service. Arrangements were accordingly made with the Presidents of the three Royal Colleges for a survey to be made of the existing consultant and specialist services to ascertain whether there was a surplus or shortage in any area and whether redistribution would be desirable in any post-war hospital service. The Royal Colleges had established a Central Medical Academic Council, including representatives of the universities, to perform the necessary work at the centre, and area committees based on the universities to undertake the collection of information and preparation of lists locally. Mr. Brown had invited the vice-chancellors of the universities to act as chairmen of these area committees. It was hoped that this survey would make available for the first time information about the numbers and types of consultants and specialists in the country. Information was already to hand about specialists in the Services. Misunderstanding appeared to have arisen owing to the fact that to arrive at the numbers and types of consultants and specialists it was necessary to draw up lists of names. Mr. Willink said he was glad of the opportunity to assure the profession, and especially its members on war service at home or abroad, that such lists would be treated as strictly confidential. They would not be used as a test for eligibility for appointment as consultant or specialist in any comprehensive post-war hospital service. If, at a later date, it was thought desirable that consultant and specialist appointments should be restricted to persons qualified in some particular manner and enrolled in a list for the purpose, it would be necessary to provide for the establishment of a register on a statutory basis in a manner approved by Parliament.

Post-war Housing

A debate on post-war housing took place in the House of Lords on Feb. 8 on a question by Lord ADDISON to the Minister of Works. Lord Addison asked what steps the Government was taking to meet requirements in regard to plans, designs, and costs and to alternative methods and materials.

Lord PORTAL said that on all housing matters he was working in complete accord with the Minister of Health, whose Department dealt with the local authorities, and also with the Secretary of State for Scotland. The Ministry of Reconstruction and the whole Government were alive to the vital necessity for getting on with the question of housing at the right moment, for it was largely a matter of timing in view of the fact that the war effort was still demanding nearly all the available labour and materials in the country. The limit of expenditure on repairs to war-damaged and other houses was recently raised from £100 to £500. Privately owned houses would participate in this, and the instructions to licensing officers had been adjusted accordingly. Local authorities should be able to secure the carrying out of the great proportion of these repairs, and the back of them should be broken by the end of the year. If that could be done, an awkward job would be out of the way. The Government had decided that in the late spring and early summer arrangements would be made for the use by local authorities of plant and machinery, as these became available from airfield construction, for the preparation of housing sites sufficient for the maximum number of houses that could be built during the first two years after the war. Sites would be settled and approved between the local authorities and the Minister of Health. The Ministry of Works was putting up a number of houses to demonstrate the use of different materials in permanent house construction, and to ascertain the costs. The question of the suitability of the houses rested with the Ministry of Health. Experiments were being made in the conversion of wartime hostels into temporary houses. The Government had gone a considerable way in getting out plans for a type of temporary prefabricated house. In considering prefabrication on a large scale, the questions of materials and the capacity available for their manufacture were vital if it was to be started before the war was over. The first prototype (made by hand) would be ready at the end of April, when it would be shown to the Minister of Health, the Secretary of State for Scotland, and others interested in the matter. To avoid these temporary houses remaining in existence as they did after the last war, the Government had decided that, if approved, they should be publicly owned and licensed for a period. The Ministry of Works was also exploring with certain local authorities the extent to which it would be economic and practicable to convert large houses in urban districts into comfortable flats. One of the most effective ways of securing efficiency and economy in houses would be by far greater standardization of essential parts than hitherto: already a degree of success in standardization had been achieved. For instance, the various sizes of metal windows had been reduced by about 80% to three basic types which could be produced in 50 varieties. The types of baths had been reduced from 40 to 5, and water heaters, tanks, and cisterns from 270 to 100. Other items were also being dealt with along these lines. They would try to give the people houses to live in at rents which they could afford to pay. Steps were being taken to ensure the supply of all materials required for post-war building. The report of the Mission which went to America was issued on Feb. 7, and would be of great value. The report of Sir George Burt's interdepartmental committee would, he hoped, be published next month. With regard to the post-war work, the Ministry was fully alive to what the ex-Service man wanted and it would not be the fault of the various Departments concerned if they did not give him what he required.

School Meals in Scotland.—On Jan. 18 Mr. JOHNSTON informed Mr. Thomas Henderson that for October, 1943, the number of children receiving meals (dinners or lunches) in schools in Scotland was 159,364, representing 21.2% of the number on the rolls, compared with 141,630, or 18.8%, in June, 1943. The number receiving milk was 513,502, representing 67.6% of the numbers on the rolls, compared with 520,124, or 68.5%, in June, 1943.

Infant Mortality in Scotland.—On Feb. 8 Mr. JOHNSTON informed Mr. T. Henderson that the five counties and large burghs respectively in Scotland with the highest death rates among children between one and 12 months in 1941 were: counties: Selkirk, Ayr, Kincardine, Dunbarton, and Caithness; large burghs: Port Glasgow, Dumbarton, Coatbridge, Glasgow, and Hamilton.

Calcium in Bread.—On Feb. 8 Sir E. GRAHAM-LITTLE asked the Minister of Food whether, in view of the recent demonstration, details of which had been submitted to him, before a scientific society that the added calcium was due to a misconception, if, as the increased consumption of calcium salts raised the blood pressure from which condition every fourth person of late middle age died, he would institute an inquiry on the subject independent of the Medical Research Council, and, until the findings of this inquiry were available, stop addition of calcium to bread. Col. LLEWELLEN said he was not aware of the demonstration to which Sir E. Graham-Little referred. He was advised on the best authority that the small amount of calcium now added to bread was beneficial for the continued good health of the nation and had not the effects which the question would seem to imply. The answer to the second part of the question was "No, sir."

Notes in Brief

The Disabled Persons (Employment) Bill, which has passed the House of Commons, was read a first time in the House of Lords on Feb. 8.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a Congregation held on Feb. 5 the degrees of M.B., B.Chir. were conferred by proxy upon J. W. Evans, M. P. Durham, L. I. Bromley, B. W. Rhodes.

During the month of January titles of the degrees of M.B., B.Chir. were conferred on M. K. E. Reaney of Girton College.

No. 4

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Jan. 29.

Figures o Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are or: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	60	3	14	2	2	113	12	28	4	3
Deaths		1	—				1	2		
Diphtheria	777	28	171	152	31	809	32	227	95	35
Deaths	19	—	6	2	2	24	1	6	5	—
Dysentery	176	27	56	—	1	178	16	24	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	1	1	—	—	—	4	—	1	—	—
Deaths		1					1			
Erysipelas			62	4	3		—	58	14	3
Deaths		—								
Infective enteritis or diarrhoea under 2 years				6					22	
Deaths	48	10	12	14	2	33	3	8	7	3
Measles	919	153	116	189	—	12,601	821	392	39	41
Deaths	1	—	—	—	—	17	3	2	—	—
Ophthalmia neonatorum	65	2	24	—	—	104	5	20	—	1
Deaths										
Paratyphoid fever	4	—	2	—	—	33	—	1	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal*	1,079	88	35	19	11	1,528	89	27	3	4
Deaths (rom influenza)	104	16	6	2	1	125	18	7	—	—
Pneumonia, primary			276	7				363	20	
Deaths		71		20	12		61		17	14
Polio-encephalitis, acute	2	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	4	—	2	—	—	10	—	2	4	—
Deaths		—					—			
Puerperal ever		7	16		—	—	1	17		—
Deaths										
Puerperal pyrexia†	167	10	12	4	1	162	5	16	2	1
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,928	138	217	26	71	2,272	153	357	36	50
Deaths	3	—	—	—	—	5		2	—	
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	2	1	2	16	5	6	—	4	7	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough	2,104	177	133	64	15	1,790	104	119	55	3
Deaths	13	3	2	3	1	12	2	2	3	1
Deaths (0–1 year) In ant mortality rate (per 1,000 live births)	433	67	69	61	20	416	49	77	43	26
Deaths (excluding still-births)	5,346	840	723	282	137	5,449	823	717	232	148
Annual death rate (per 1,000 persons living)			16·6	18·4	‡			16·2	15·3	‡
Live births	6,747	851	888	411	280	6,232	728	908	401	265
Annual rate per 1,000 persons living			18·1	26·8	‡			18·5	26·4	‡
Stillbirths	220	25	35			242	22	41		
Rate per 1,000 total births (including stillborn)			38					43		

* Includes primary form or England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal ever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements o population, birth and death rates for Northern Ireland are no longer available.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week the incidence of measles went up by 258, of diphtheria by 65, and of dysentery by 28 cases. There were 182 fewer notifications of scarlet fever, 111 of whooping-cough, and 43 of acute pneumonia.

The 104 deaths from influenza recorded in the large towns represent a decrease of 39. Deaths in Greater London fell from 54 to 39.

Measles appears to have begun its seasonal rise: notifications have increased from 515 to 919 during the past month and are now at the highest level for twenty-one weeks. The only rises of note during the week were in Lancashire by 68, London by 35, and in Durham by 28 cases. The rise in diphtheria was due mainly to Yorks West Riding 30 cases more, and Lancashire 27 more. Scarlet fever was less prevalent in the south-eastern and south midland regions: there were 43 fewer cases in Surrey. Whooping-cough notifications were down by 29 in Essex and by 28 in Lincoln. The only notable difference in the notifications of acute pneumonia was a decrease of 53 in London.

The one fresh outbreak of dysentery during the week was in Denbighshire, Colwyn M.B. 14. In Middlesex notifications rose from 11 to 27; in London they fell from 41 to 27. In the o'her established large outbreaks the incidence remained unchanged: Kent 20, Lancashire 20, Surrey 12, and Yorks West Riding 10.

In *Scotland* notifications of whooping-cough fell by 100, acute primary pneumonia by 24, measles by 22, and dysentery by 13; there were 31 more notifications of scarlet fever, due to the experience of the western area. Dysentery in Edinburgh increased from 7 to 19 cases, the only other large centre of infection being Fife county, with 11 cases.

In *Eire* diphtheria increased from 110 to 152 cases. The incidence was widespread, the largest returns being Dublin C.B. 33, and Co. Carlow, Carlow U.D. 27.

In *Northern Ireland* relatively large declines were recorded in the incidence of scarlet fever by 28, and of diphtheria by 20.

Tuberculosis Figures

Mr. Willink furnished on Feb. 10 the following comparative figures for all forms of tuberculosis:

Year	Deaths from Tuberculosis		Notifications of Tuberculosis	
	England and Wales	Scotland	England and Wales	Scotland
1938	26,176	3,431	58,093	7,565
1939	25,623	3,526	53,835	7,097
1940	28,144	4,003	54,929	7,722
1941	28,670	4,174	59,976	8,294
1942	25,547	3,998	63,732	9,048

Week Ending February 5

The returns of infectious diseases in England and Wales during the week included: scarlet fever 2,032, whooping-cough 2,116, diphtheria 733, measles 1,162, acute pneumonia 1,115, cerebrospinal fever 71, dysentery 161, paratyphoid 9, typhoid 5. Influenza deaths in the great towns numbered 78.

Points from Abroad

According to Heismeyer (*Dtsch. med. Wschr.*, 1943, **69**, 667) an attempt to rehabilitate the tuberculous alongside of the non-tuberculous was unsuccessful at Hohenlychen, even when the former were non-infectious. In spite of talks by doctors and others, the healthy workers had too great a fear of infection to tolerate the presence of the tuberculous in the workshops. Investigation of large numbers of people by means of *x* rays continues. Out of the cases of tuberculosis discovered in this way among 6 million people in Westphalia it was found that only 33.9% of those with active disease had previously been known to the health authorities as tuberculous.

Influenza has been prevalent in Denmark. In the second week in January there were 3,000 cases—mostly of a mild character—in Copenhagen.

Tins of sweetened condensed milk now contain 14 oz. and of unsweetened 16 oz., and the four-weekly allowances, free of points, for infant feeding have therefore been adjusted as follows: for children under 5 months up to 10 tins of the sweetened or up to 18 tins of the unsweetened milk; children 5 to 6 months inclusive 11 tins or 21 tins respectively; up to 9 months 12 or 23 tins, and 10 to 12 months 13 or 24 tins. It is assumed that 2¼ tins of sweetened or 5 tins of unsweetened condensed milk will be available each 4 weeks on the infant's points ration.

Medical News

The next session of the General Medical Council will open on Tuesday, Feb. 29, at 10 o'clock, when the President, Sir Herbert Lightfoot Eason, will take the chair.

The next quarterly meeting of the Royal Medico-Psychological Association will be held at 11, Chandos Street, W., on Thursday, Feb. 24, at 10.30 a.m. The subject for discussion is "Certain Aspects of Convulsion and Insulin Therapy." Papers will be read by Dr. E. B. Strauss on electroplexy in out-patient practice, by Dr. J. Carse on convulsant therapy with special reference to gross cytological changes in the blood, and by Dr. D. E. Sands on modified insulin treatment in neuroses.

At the meeting of the Medico-Legal Society to be held at Manson House, 26, Portland Street, W., on Thursday, Feb. 24, at 5 p.m., specimens and slides will be shown by Sir Bernard Spilsbury, Prof. W. G. Barnard, Dr. Eric Gardner, and Dr. C. Keith Simpson. Members may introduce guests to the meeting. Tea at 4.30.

A three-months course of instruction for Part II of the examination for the Diploma in Psychological Medicine will be held at the Maudsley Hospital, Denmark Hill, S.E.5, on Monday, Wednesday, and Friday afternoons, beginning on Monday, Feb. 28. A concurrent course of twelve demonstrations in clinical neurology will be given. Both courses are contingent on the enrolment of a sufficient number of applicants. Inquiries should be addressed to Dr. W. W. Kay, acting hon. director, Maudsley Hospital Medical School, Central Pathological Laboratory, West Park Hospital, Epsom, Surrey (Tel. Epsom 1408).

At a meeting of the History of Medicine Section of the Royal Society of Medicine to be held at 1, Wimpole Street, on Wednesday, March 1, at 2.30 p.m., Prof. S. Lyle Cummins will read a paper on "Some English Phthisiologists," and there will be an exhibit dealing with Spanish medicine.

A meeting of the Association of Industrial Medical Officers will be held at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, on Saturday, March 4, at 11 a.m. There will be a morning session for the conduct of private business and an afternoon session beginning at 2.30 for a discussion on the influence of industry on obstetrics and gynaecological conditions. Openers of the discussion will be Mr. R. A. Brews, Dr. Catherine Swanston, and Dr. Joan McMichael.

Rules setting out the procedure for admission to the *Roll* of "existing" assistant nurses and assistant nurses with "intermediate" qualifications, which have been made by the General Nursing Council, have been presented to Parliament. They cover the period before rules prescribing the training of assistant nurses (which are now being prepared) are made and approved.

In future all nurses will be required immediately after they are admitted to the State register to take a year's training or employment in midwifery or district nursing, or in nursing mental, tuberculosis, or fever cases or the chronic sick. Nurses who have already had at least a year's employment in one of these particular departments and those accepted for the nursing services of the Crown are exempt.

The National Foundation for Infantile Paralysis of the United States has granted $10,325 to the Illinois Committee on Infantile Paralysis to study the persistence of the virus of poliomyelitis in the stools of convalescent and healthy carriers, for investigation of the port of entry and exit of poliomyelitis in acute cases, and for the correlation of neuropathological and clinical findings in cases of poliomyelitis during an acute outbreak.

The 8th Turkish National Medical Congress was held in October under the protective chairmanship of the President of the Turkish Republic and the honorary chairmanship of the Prime Minister. A very full and comprehensive programme was worked out by the Congress Board under the guidance of its chairman, Dr. Refik Saydam. The congress was opened by the Minister of Public Health, Dr. Hulûsî Alatas. On the first day a number of papers were read on diseases of the gall-bladder; on the second day there were a number of interesting papers on the medical aspect of sport and physical training.

The Order prohibiting practising midwives from taking employment other than in midwifery is to continue in force until May 31 next. After that date applications to take up other work or further training will be considered on their merits. The need for practising midwives is still acute, so it is hoped that such applications will be few. The Ministry of Labour also announces that in future nurses under the age of 27 will not in general be permitted to enter industrial nursing employment.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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ANY QUESTIONS?

Influenza Statistics

Q.—*One is led to believe that the severity of an influenza epidemic can be judged by the number of deaths resulting therefrom. Influenza is not in itself a fatal disease; therefore one must presume that deaths attributed to influenza are the result of influenzal pneumonia. There is some considerable difficulty and often a doubt in diagnosis of pneumonia as due to infection by the influenza bacillus, especially in general practice, from which most of the deaths will be recorded. Many doctors, myself included, never mention the word "influenza" in a death certificate at any time. In view of these circumstances what reliability can be placed on statistics recording deaths from influenza? I think it will be agreed, too, that an influenza epidemic in its typical form dies out suddenly, often within a few days, yet the death rate is recorded as comparatively high for a period of four or more weeks after the collapse of the epidemic. What is the explanation of this?*

A.—The weekly number of deaths for which influenza is certified to have been the sole, the principal, or an associated cause is an *index* of the severity of an epidemic—not an accurate measure of the loss of life effectively caused by the epidemic. In all official estimates of the cost of an epidemic or pandemic, regard is had to the fact that *pari passu* with an increase in the recorded mortality from influenza there is an increase in the recorded mortality from pneumonia, bronchitis, and (usually) pulmonary tuberculosis. As an index, we do not think the rubric influenza worse than many others. It must be remembered that deaths assigned to measles—a far more clear-cut disease from the point of view of individual diagnosis than influenza—will not give an exhaustive account of the epidemic because some of the deaths will be certified as due to bronchopneumonia without mention of the precedent measles, and therefore cannot be tabulated under the heading of measles. We think that typically, epidemics of influenza certainly rise and decline rapidly, but as the data in question are of deaths one would anticipate a relatively slow return to the normal rate of mortality.

Fibrositis and Sciatica

Q.—*What are the causes of fibrositis, with particular reference to sciatica, of which fibrositis seems to be regarded as the commonest provoking agent?*

Q.—*There appears to be a certain conflict of opinion these days on the pathology of sciatica. I feel it would be of value to have a definite classification of the causes of this condition, with the more important points of differential diagnosis.*

A.—Of the many provocatives of fibrositis the most important are fatigue, prolonged strain on muscles unaccustomed to hard work, and exposure to cold, especially to local chilling, as by a draught. Some people develop fibrositis the day after taking alcohol, especially beer or champagne. Their blood uric acid is seldom raised. Others invariably suffer from acute fibrositis as an accompaniment of coryza. There is a widespread acute form which occasionally occurs in epidemics and is presumably due to an infective agent. Fibrositis always accompanies rheumatoid arthritis. In the common lumbo-sacral and nuchal fibrositis there is no evidence of an infection and the erythrocyte sedimentation rate is not raised. Very rarely can fibrositis be traced to focal sepsis or gout. The process which produces the tenderness is believed to be an accumulation of irritant metabolites, possibly lactic acid. Deep massage, further exercise and heat will therefore produce benefit by improving the local circulation and dispersing the chemical irritants.

The relationship to sciatica is in the opinion of many quite definite, although this view is not held by all. In an analysis of 1

cases of sciatica, lumbago preceded the onset of acute sciatica (with the usual signs, including loss of ankle-jerk) in 67%. A description of the pathology of all forms of sciatica could not be condensed to a few paragraphs. The questioner is urged to refer to Sir Arthur Hurst's recent article in the *Journal* and the entertaining correspondence which has followed. He should read also the articles in the *Medical Annual*, 1942, p. 283, where a working classification will be found, and the *Medical Annual*, 1943, pp. 310–17, which contain most scholarly and useful critical reviews.

Leucoplakia of Tongue

Q.—*What are the more recent views as to the causation, outlook, and treatment of leucoplakia of the tongue?*

A.—There is nothing very new to be said concerning leucoplakia of the tongue, as regards either pathology or treatment. Possibly syphilis occupies a less prominent place than it did in the aetiological picture, since the disease is more adequately treated in its earlier stages. Vitamin deficiency has, as in the case of many other conditions, been recently suggested as an underlying factor in causation. In dealing with leucoplakia it is more appropriate to speak of the conduct of the case than of its treatment, and the proper conduct of such a case calls for careful judgment. For the most part negative measures are adopted—avoidance of all further local irritation, including that caused by oral sepsis. If the Wassermann reaction is positive, a course of small injections of arsenical or other compounds is advisable. If the condition is very localized, excision may be indicated, but the larger operations devised to excise large areas of the tongue surface are rarely justified. Careful watch for the onset of induration around the fissures will lead to the early recognition of malignant change, and is perhaps the most important point in the "conduct" of the case.

Glossitis

Q.—*Can you suggest treatment for a glossitis of some two years' standing, involving the side of the tongue? There is no evidence of fissuring, but the area is abnormally red, with some venous engorgement, and the patient complains of a "burning" sensation. Vitamin B, iron, and local application of a vitamin A and D concentrate have been tried.*

A.—The information given is not sufficient to allow any conclusions to be drawn as to the nature of the lesion. The persistence in one locality suggests the action of some local factor such as irritation from an ill-fitting denture or sharp edge of a tooth. Local irritation may sometimes be due to pipe smoking. Prolonged empirical treatment of a chronic lesion in the tongue is not to be recommended until such factors have been excluded. The possibility of precancerous change should be borne in mind and in doubtful cases a biopsy is a safeguard.

Diet in the Puerperium

Q.—*Is the present-day fashion of giving "full diet" to the patient from the first day of her confinement correct? It has always been my practice to consider the first three days of the puerperium as anxious ones. I advise a diet of fluid food with tea and toast or thin bread-and-butter until the temperature has been normal for three days and the bowels have been evacuated.*

A.—The quantity and quality of food that can be eaten during the first three days of the puerperium should be governed by the appetite of the mother. If she has a craving for "a heaping plate" then it should be satisfied. Within a few hours of delivery there is a marked diuresis, and the woman may also be dehydrated as the results of the labour. Fluids, including milk, should be given liberally. Mothers often forget to utilize the orange juice provided by the Ministry of Food. There is no reason why for the first three days the diet should be restricted to fluid and bread-and-butter. Salads, cheese, oatmeal, vegetable soups (flavoured with marmite), fish, milk puddings can be taken at any time during this period. It is the quality of the food and the way it is cooked and presented that matter. No longer are surgical patients kept on a rigid fluid diet for a week after operation. A little of what she fancies does the parturient woman good provided it does not harm the baby.

Dandruff

Q.—*What is the most successful treatment of dandruff? Is there any substance that promotes the growth of hair on the scalp?*

A.—Dandruff of the scalp is usually regarded as a manifestation of seborrhoea, and is by many considered to be the result of an infection of the scalp with the pityrosporon. The seborrhoeic basis calls for remedies which are useful for that condition, of which sulphur is probably the best, in the form of a 2% ointment made especially soft by the addition of a nut oil. This can be rubbed in at night or, in the case of a woman, once a week, when the concentration of sulphur can be considerably increased. Washing of the head once a week or once a fortnight with any form of soap is an advantage. A hair tonic in the morning augments the treatment and is generally prescribed in the form of a resorcin lotion. A convenient application which is used without the sulphur remedy consists of chloral hydrate 2% in a lotion containing a little spirit, castor oil, and rose water.

Thymus and Death under Anaesthesia

Q.—*Twin boys aged 8 were to have their tonsils removed on the same day. The first to be operated on died a few minutes after the operation and was found to have a greatly enlarged thymus. It is felt that the second boy's tonsils should be removed, but there is natural hesitation on the part of the parents. X rays have failed to reveal the presence of an enlarged thymus. What is the present state of opinion on this problem? And what methods of diagnosis can be employed? What advice should be given to the parents?*

A.—Medical opinion is now against any connexion between an enlarged thymus and death under anaesthesia. Nevertheless it would doubtless be difficult to persuade the parents in this instance that an operation on the surviving twin could be safely undertaken even if *x* rays have failed to reveal a thymic shadow. There is no other method of diagnosis. The best advice would be to give a trial to non-operative treatment of the diseased tonsils. This includes a choice of local application twice a day of Mändl's paint or of a sulphonamide paint such as the following: albucid soluble 96 gr.; distilled water 120 minims; emulsion of peppermint with aniseed 40 minims; glycerin to 2 oz. *X*-ray applications are also claimed to be of service in reducing the size of enlarged tonsils.

An Old Midwives' Tale

Q.—*There is a widespread popular belief that an 8-month foetus is less viable than a 7- (or 9-)month foetus. Is this an old midwives' tale, or is the alleged greater viability of the 7-month foetus supported by statistical evidence? Those with whom I have discussed the matter are divided in their views, but none the less dogmatic.*

A.—This is a popular fallacy of uncertain origin. If we can exclude those cases where the foetus is unduly large or post-mature, and thereby subject to birth trauma, all the evidence goes to show that the more complete the development of the child the better are its prospects for survival during birth and during the neonatal period, if not in later life. Statistical proof is provided by the reports of all maternity hospitals, and there is a large literature on the subject. Two recent references are *Foetal and Neonatal Death*, by Edith L. Potter and F. L. Adair, University of Chicago Press, 1940; and C. McNeil, *Edinb. med. J.*, 1943, **50**, 491.

Thumb-sucking

Q.—*A minor problem of general practice that bothers me is what advice to give to a mother who complains that her child sucks its thumb. I would like an answer to these questions: (1) At what age can it be said that thumb-sucking is abnormal? (2) Granted that excessive thumb-sucking is an expression of psychological discomfort, what steps should one advise the mother to take? I know, for example, of one child of 7 who always goes to sleep with his thumb firmly stuck in his mouth. My dental friends tell me that deformity of the palate and malocclusion are consequences of this habit.*

A.—Thumb-sucking, like the wartime increase in smoking, illustrates the natural human tendency to revert in times of emotional tension to the first-experienced means of gaining relief. The normal duration of the habit is relative to the history of the child. When early infancy has been free from serious traumata, the need for the consolation of thumb-sucking should rapidly decline as increased satisfaction is gained from the environment by crawling, walking, and other activities developing towards the end of the first year. On the other hand, if the child has suffered from feeding difficulties, illness, or lack of satisfying maternal care, sucking may persist much longer to counterbalance a sense of deprivation. To forbid the habit is like blocking a safety valve, and may result in masturbation or other symptoms of unrelieved distress. Advice to mothers should be directed towards the cause of the child's maladjustment, and should include showing extra affection, allaying fears, and providing additional outlets both in imaginative play and in social contacts. If the thumb is rarely in the mouth except at night, it is useful to give a sweet to be chewed when going to sleep. In mild cases these measures usually suffice, and if a child persists, even at 7 years, only in the "token comfort" of a thumb against the lips occasionally, this is not likely to do harm. If, however, sucking is vigorous in character, frequent, and prolonged much over 2 years, it may be necessary to get psychological aid in eliminating the cause of the habit before this results in dental or palatal malformations.

INCOME TAX

Claims for Support of Mother and Brother

J. F.'s mother is a widow with a very small income and he sends most of his earnings to her for her support and for the education of his younger brother. What claim can he make?

*** He can claim an allowance of £50 if he "maintains" his mother, but that amount is reduced by £1 for every £ by which his mother's income exceeds £50.

Enforced Removal

A. R.'s premises were bombed and he was compelled (*a*) to remove furniture to new premises, and (*b*) to buy new furniture, etc. Can he charge these expenses?

*** (*a*) Yes. (*b*) He can charge the cost of replacement in so far as it was not covered by insurance or other indemnities. (The answer of course applies to professional equipment.)

Replacement of Cooker in Nursing Home

F. C. explains that in 1942 the kitchen range in her nursing home required replacement. A range similar to the old one was unobtainable, and an "Aga" cooker was installed. The inspector of taxes has restricted the allowance to F. C.'s share of the estimated cost of replacing the old range with a similar one.

*** The inspector is right in principle; the element of improvement represents capital outlay. On the other hand the estimate of £20 for the cost of replacing the old range with a similar one may be insufficient. We advise F. C. to press for a substantial increase and, if necessary, to obtain an estimate from a local builder on the point.

Accommodation Provided on Crown Premises

C. G. is supplied with a bedroom and a sitting-room in a Ministry of Pensions hospital. The annual value of the rooms is estimated at £19 10s., and the inspector of taxes proposes to bring this amount into assessment under Schedule A as from April, 1941. Is this correct?

*** Yes—assuming that C. G. has had the use of the accommodation since April, 1941, and that the premises belong to the Crown. The liability arises because the exemption conferred on premises "belonging to the Crown" does not extend to "apartments . . . in the occupation of any officer of the Crown by right of his office or otherwise."

Expense on Taking Over a Practice

"M.B., CH.B." recently purchased a practice and inquires as to the allowance for (*a*) cost of removal from the town where he had been acting as a locumtenent, (*b*) legal and other expenses in connexion with the purchase of the premises of the new practice, and (*c*) effecting some structural alterations to reduce domestic work and thereby free his wife for assistance in the practice.

*** (*a*) and (*b*). No deduction can be claimed for these expenses; they represent capital expenditure in order to carry on the practice. (*c*) This also falls under the ban as capital expenditure, but any reasonable amount paid to the wife for her assistance in the practice can be deducted.

Service in the Forces: Professional Expenses

W. H. and J. N. M. inquire as to the allowance against Government pay for expenses incurred in the form of subscriptions to professional societies, and in replacing out-of-date medical books.

*** Official pay is assessable under Schedule E, and the rule with regard to expenses is that to be allowable they must be incurred wholly, exclusively, and necessarily in the performance of the duties of the office. If the employer—in the case of ordinary non-Government employment—requires his assistant to be a member of the B.M.A., for instance, then payment of the subscription is a "necessary" expense of that employment and the amount can be deducted. Such a requirement, however, does not apply to Government service, and neither is an officer required to maintain his medical books up to date, and consequently such expenses fall under the ban of the restrictions and rigid rule quoted above.

"Pay as you Earn"

A. B. inquires whether the new system of deducting tax will apply to payments he makes to a married woman acting as locumtenent for an absent partner. Her remuneration is £550 a year with car and all living expenses.

*** Yes. As from April 5 all individuals holding an office or employment will come within the new arrangements, whatever the amount of the remuneration.

LETTERS, NOTES, ETC.

Local Antiseptics

Mr. W. DOUGLAS PARK (London Hospital) writes: The use of sulphonamides, proflavine, and now penicillin has shown that the local use of antiseptics is both justifiable and desirable. For some years I have been using potassium permanganate solution as a local application on varicose ulcers. It is, of course, far from new as an antiseptic, but very few people seem to use it, and all have been impressed and usually rather surprised at its success when they first do so. I use a 1 in 2,000 solution applied once or twice a day, or even more often, and find that it produces a clean granulating wound in a remarkably short time in practically all cases. It has the notable characteristic of greatly diminishing the extremely unpleasant smell of these ulcers. I have found the solution useful on many other dirty wounds besides varicose ulcers, particularly chronic osteomyelitis following compound fractures. I write this short letter as I think it may prove helpful to others who may not have thought of using it.

Treatment of Coryza

Dr. RUTH HUNTER (Sandwich) writes: Referring to Dr. Piney's letter (Jan. 29, p. 163) on the treatment of coryza with ephedrine and argyrol in normal saline, and pointing out the instability of a solution containing these components, I should like to mention that a stable solution, isotonic with, or, to use a more homely term, "comfortable" to, the nasal mucous membrane and non-crust-forming, can be made by prescribing a 10% solution of argyrol in quarter normal saline. Ephedrine may be used if necessary five minutes before the argyrol to reduce congestion and so permit a more effective permeation of the argyrol in the nasal passages. The use of a spray is more effective and convenient than that of a dropper.

Infusion of Fluid by Sternal Puncture

Dr. A. P. HARDMAN writes: I was most interested to read Mr Hamilton Bailey's article (Feb. 5, p. 181) on the infusion of fluid by sternal puncture. In 1941 I saw the method very ably demonstrated by Dr. Mabel E. Carmer of New York State on an infant suffering from severe marasmus which was under my care. The extreme dehydration in this case had rendered intravenous infusion practically impossible. There is no doubt that this method of infusion can be of great value in such cases. I feel grateful to Mr. Hamilton Bailey for his clear review of what had appeared to me an unorthodox yet most rational method of administering fluids.

War in the Nursery

The HON. SECRETARY of the National Society of Children's Nurseries writes: We see stated in your issue of Jan. 8 (p. 50) that in the war nurseries there is "a high incidence of infection and a low incidence of happiness." As a society we consider that this is a very grave allegation to make. It is a dangerous one to put forward at a time when the Government has found it necessary to make nursery provision for children of women whose work is essential to the effort to end the war. Such an allegation seems to us to be grossly exaggerated and needs to be substantiated. Surely it would have been more useful to influence those responsible to improve conditions in the nurseries which Dr. Helen Mackay has investigated. The power of your readers is immense if they wish to be assured that children are properly cared for in any nursery set-up. This society would welcome an expression of such determination from the doctors.

Supplies of Iodine

The IODINE EDUCATIONAL BUREAU write: May we point out an error of fact in the interesting article on "Skin Disinfection" in your issue of Feb. 5? Iodine is not, as stated, in short supply at present. The reserve stocks in this country are entirely adequate to meet all requirements for some years. In its memorandum "Economy in the Use of Drugs in Wartime," the Therapeutic Requirements Committee of the Medical Research Council placed iodine in the category of drugs essential for certain purposes but not for others and in the use of which economy should be observed. It added the essential qualifying note, however, that adequate supplies are available and that the need for economy relates to *alcoholic* solutions. We are aware of the importance of conserving supplies of alcohol at this time and have been working towards this end by advocating aqueous instead of alcoholic solutions of iodine—a policy endorsed by the Therapeutic Requirements Committee. Incidentally, the germicidal value of the aqueous iodine solution is superior to that of the so-called "tincture"—a fact demonstrated by Claudius so long ago as 1902 and confirmed many times since, notably by such masters in the field of disinfection as Bulloch (1929) and Colebrook (1941).